Prepared for

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DRAFT RESTRICTED ACTIVITIES WORK PLAN

HUNTERS POINT ARTISTS' PROJECT
NAVY PARCELS B-1, C, AND UC-2
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

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Project Number: WR1247.03.01

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS AND ABBREVIATIONS

AC	asphaltic concrete
ADMP	Asbestos DustMitigation Plan
ARIC	Area Requiring Institutional Controls
ATCM	Airborne Toxic Control Measures
BAAQMD	Bay Area Air Quality Management District
BCT	Base Realignment and Closure Cleanup Team
bgs	below existing ground surface
CCR	California Code of Regulations
CDPH	California Department of Public Health
CERCLA	Superfund or Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
COCs	chemicals of concern
CP DevCo	CP Development Co., LP
CRUP	Covenant to Restrict Use of Property
CSO	Caretaker Site Office (Department of the Navy)
CWA	Clean Water Act
DCP	Dust Control Plan
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EHSP	Environmental Health and Safety Plan
ESLs	Environmental Screening Levels
FFA	Federal Facilities Agreement
Geosyntec	Geosyntec Consultants, Inc.
HPAP	Hunters Point Artists' Project
HPS	Hunters Point Shipyard

ICs	Institutional Controls
IR	Installation Restoration
LUCRDs	Land Use Control Remedial Design documents
mg/kg	milligrams per kilogram
MPPEH	material potentially presenting an explosive hazard
Navy	U.S. Department of the Navy
NOA	Naturally Occurring Asbestos
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
OCII	Office of Investment and Infrastructure
OSHA	Occupational Safety and Health Administration
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PM	Project Manager
PPE	personal protective equipment
PVC	polyvinyl chloride
QSD	Qualified SWPPP Developer
RACR	Remedial Action Completion Report
RAs	remedial actions
RAWPs	Remedial Action Work Plans
RDs	remedial designs
RGs	remedial goals
RMP	Risk Management Plan
ROD	Records of Decision
ROICC	Resident Officer in Charge of Construction
RPM	Remedial Project Manager

RSLs	Regional Screening Levels
RWQCB	Regional Water Quality Control Board
SARA	The Superfund Amendments and Reauthorization Act of 1986 (SARA)
SFDPH	San Francisco Department of Public Health
SIP	Soil Import Plan
SSHO	Site Safety and Health Officer
SVE	soil vapor extraction
SVOCs	semivolatile organic compounds
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resource Control Board
TCE	trichloroethene
TMI-CM	Townsend Management, Inc.
TPH	Total Petroleum Hydrocarbons
UCRP	Unexpected Conditions Response Plan
USEPA	United States Environmental Protection Agency
VOC ARIC	Area Requiring Institutional Controls for VOC vapors
VOCs	volatile organic compounds
WDRs	Waste Discharge Requirements
Work Plan	Restricted Activities Work Plan

1. INTRODUCTION

This Restricted Activities Work Plan (hereafter referred to as "Work Plan") was prepared in support of the Hunters Point Artists' Project (HPAP), which is being conducted on a portion of the former Hunters Point Shipyard (HPS), San Francisco, California. The Work Plan was prepared by Geosyntec Consultants, Inc. (Geosyntec) on behalf of CP Development Co., LP (CP DevCo). The HPAP will take place within portions of HPS Parcels A, B-1, C and UC-2 (Site, Figure 1).

In December 2004, Parcel A was transferred by the Navy to the San Francisco Redevelopment Agency, now operating as the Office of Community Investment and Infrastructure (OCII). Parcel A is not subject to environmental restrictions and is being developed by CP DevCo in accordance with a Disposition and Development Agreement between OCII and CP DevCo. Because Parcel A is not subject to environmental restrictions, Parcel A is not further addressed in this Work Plan. Parcel UC-2 is to be transferred to OCII in April 2015 and is subject to environmental restrictions, as described in Section 1.1, below. Parcels B-1 and C are currently owned by the U.S. Department of the Navy (Navy). The Navy, OCII, and CP DevCo expect that, prior to or during implementation of the HPAP project, Parcel B-1 will transfer from Navy ownership to OCII and will be subject to environmental restrictions. Parcel C is scheduled for transfer at a later date, likely after the HPAP is complete, and will remain in Navy ownership for the duration of the project.

This HPAP Work Plan applies to demolition, soil disturbing and construction activities, a portion of which will be implemented on Navy property (Parcels B-1 and C) and a portion of OCII property (Parcels A and UC-2). The HPAP Work Plan provides an understanding of the existing environmental conditions, summarizes the remedial actions (RAs) performed by the Navy, outlines the regulatory framework set in place for redevelopment and construction activities, identifies the Institutional Controls (ICs) that are a component of the remedy, and references the remedial designs (RDs) that must be considered during HPAP design and construction. This Work Plan, when approved by the regulatory agencies, will authorize OCII and CP DevCo to perform certain restricted activities on the Site.

1.1 Background

The Navy has conducted environmental investigations, feasibility studies, removal actions, and remedial actions at the former HPS in San Francisco, California. These activities have been conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Clean Water Act (CWA), and state-specific environmental programs in consultation with the United States Environmental Protection Agency (USEPA), California Department of Toxic Substances Control (DTSC), and the California Regional Water Quality Control Board (RWQCB) as specified in a Federal Facilities Agreement (FFA) for HPS (Navy, 1992). These federal and state regulatory agencies, along with the Navy are collectively referred to as the FFA Signatories.

The land at HPS is divided into Parcels, as depicted in Figure 1. In accordance with the final Records of Decision (RODs) for each Parcel, the Navy is implementing environmental cleanup activities to provide for the protection of human health and the environment. For implementation of environmental activities for each parcel, the Navy has prepared a RD package, which includes a Land Use Control Remedial Design (LUCRD) and Operation and Maintenance (O&M) Plan. At parcel UC-2, the Navy has completed implementation of the remedy, as documented in its Remedial Action Completion Report (RACR) (ERRG, 2013, 2014a), has made a finding that the property is suitable for transfer, as documented in the Finding of Suitability to Transfer document (TriEco-Tt, 2014), and will transferred the land to OCII in April 2015. The Navy is still in the process of implementing the remedy in Parcels B-1 and C.

As required in the UC-2 LUCRD, OCII has entered into a Covenant to Restrict Use of Property (CRUP) with DTSC, which specifies Restrictions applicable to the Parcel. The Restrictions in a CRUP run with the land in perpetuity and are enforceable by the FFA Signatories on Owners of the Site. Generally, the Restrictions specify land uses and activities that are prohibited or are restricted except with the approval of a Restricted Activities Work Plan approved by the FFA Signatories.

This Work Plan satisfies the CRUP requirement for a Restricted Activities Work Plan and describes how the proposed soil disturbing activities will be implemented in the OCII-owned Parcel UC-2 and the Navy-owned Parcels B-1 and C.

The LUCRDs allow for the development of a Risk Management Plan (RMP), which sets forth conditions, requirements, and/or protocols that allow certain activities to be conducted that would otherwise be restricted. The RMP for Parcels UC-1 and UC-2 was finalized and approved by the FFA Signatories on 31 March 2015. This Restricted Activities Work Plan relies upon the protocols specified in the approved RMP. It details the specific activities and the controls to be implemented to ensure construction worker safety and to protect and restore the integrity of the remedy for the protection of public health.

1.2 Project Description

To support the existing artist community at HPS, the artists will be relocated from various HPS buildings to a portion of existing Building 101 and a new Artists' Building, which will be constructed as part of the HPAP. The limits of the project are depicted in Figure 2. The HPAP includes demolition of existing Buildings 109 and 110, construction of a new Artists' Building, construction of a new commercial kitchen, reconfiguration and upgrading Building 101, and installation/reconfiguration of supporting infrastructure (roads and utilities) to support the redevelopment. The portion of work to be performed on Navy Property (Parcels B-1 and C) is located in the proximity of Robinson Street and Horne Avenue.

The HPAP project will impact the existing Durable Covers installed as part of the CERCLA-required soil remedies at Parcels B-1, C, and UC-2. New cover remedies will be installed, or existing covers replaced, to the specifications provided in the Navy's RDs and Remedial Action Work Plans (RAWPs) for Parcels B-1, C, and UC-2 (ERRG, 2012a, ERRG, 2012b, ERRG, 2014b).

1.3 Project Organization

CP DevCo has entered into a Disposition and Development Agreement with OCII, which gives CP DevCo rights to develop the property. The project organization includes representatives from CP DevCo, OCII, the Navy and the prime contractor. The areas of responsibility for each organization are discussed below. Figure 3 is an organizational chart that identifies the relationships between key project personnel, as well as their organizational relationships.

The HPAP project will be led by the CP DevCo Project Manager (PM), Mr. Mark Luckhardt. Mr. Luckhardt will select, procure, and oversee the prime General Contractor and specialty contractors/consultants throughout construction. The PM will act as the liaison between CP DevCo, the Navy, OCII, community representatives, the FFA Signatory regulatory agencies, San Francisco Department of Public Health (SFDPH) and consultants to manage and coordinate all aspects of the project. The PM will be supported by a construction management firm, Townsend Management, Inc. (TMI-CM). TMI-CM will provide construction management services for the duration of the project. Geosyntec will provide support and engineering for environmental aspects of the project, including monitoring implementation of this Restricted Activities Work Plan. ENGEO, BKF Engineers and Telamon will provide geotechnical, engineering and architectural support during construction. Mr. Jeff Martin will also support the PM in his role as Environmental Compliance Manager for CP DevCo. In this capacity Mr. Martin will be the primary point of contact for the FFA Signatories, the SFDPH and work closely with Geosyntec to verify compliance with this Work Plan and other environmental permits that apply to the project.

Geosyntec will be the lead environmental consultant representing CP DevCo. In this capacity, Geosyntec will prepare and obtain approval of this Restricted Activities Work Plan by the FFA Signatories and SFDPH, coordinate compliance with the San Francisco Health Code, Article 31 with the SFDPH, monitor construction activities to verify and document compliance with this Plan, and support CP DevCo and the General Contractor should unexpected environmental conditions be encountered.

Key Navy personnel include the Lead Remedial Project Manager (RPM), the Resident Officer in Charge of Construction (ROICC), and Caretaker Site Office (CSO). The Lead RPM, Ms. Catherine Haran, will provide oversight of technical issues for the project and interface with the Base Realignment and Closure Cleanup Team (BCT), community representatives, and the CP DevCo Project Manager to ensure that the project objectives are met for work performed on Navy property. The Lead RPM will be supported by the Navy's Project Managers for Parcels B-1, C, and the Basewide Groundwater Monitoring Program (Lara Urizar, Mahbub Hussain, and Tony Konzen, respectively). The ROICC (Ms. Patricia McFadden) will coordinate remedial construction activities on Navy property, including reviewing contractor submittals, verifying personnel qualifications, and monitoring the construction. The CSO (Doug Delong) will oversee and coordinate site access and resolve site logistics issues on Navy property.

The prime General Contractor will execute most of the construction and procure additional subcontractors as needed. The prime General Contractor will oversee a variety of subcontractors that offer specialized services. Key prime General Contractor personnel will include a Project Manager, Construction Manager, Project Superintendent, and Site Safety and Health Officer (SSHO).

1.4 Regulatory Framework

The Hunters Point Shipyard site is subject to a FFA that documents the requirements for basewide cleanup and establishes the relationship between the Navy, the USEPA, the California DTSC, and the California RWQCB. Collectively, the Navy and regulatory agencies are referred to as the FFA Signatories.

In addition to the FFA Signatories, the project will have other regulatory agencies involved in permitting, monitoring, and enforcing environmental conditions that are applicable to the project, as documented in this Restricted Activities Work Plan. Each of these is described below.

Navy: The Navy is the Owner of Parcel B-1 and C and is the responsible entity under CERCLA for implementing and verifying that the remedy is maintained at the HPS. All work conducted on Navy-owned Parcels must be approved by the Navy.

USEPA: The USEPA oversees all CERCLA work performed by the Navy and will review and approve all work conducted on former Navy Parcels by subsequent land owners.

DTSC: The DTSC is a reviewing agency for all CERCLA work performed by the Navy and will review and approve all work conducted on former Navy Parcels by subsequent land owners.

RWQCB: The RWQCB is a reviewing agency for all CERCLA work performed by the Navy and is the lead agency for all petroleum hydrocarbon work performed by the Navy and subsequent property owners.

SFDPH: The SFDPH is not a FFA Signatory, is a reviewing agency for all CERCLA and petroleum hydrocarbon work, and is the lead agency for compliance related to Article 31 of the San Francisco Health Code.

BAAQMD: The Bay Area Air Quality Management District (BAAQMD) is not an FFA Signatory but is the lead agency for compliance with the Air Toxics Control Measure (ATCM), as it relates to asbestos dust at the Site.

Contact information for the FFA Signatories and the SFDPH is provided in Table 1. Changes in contact information will be submitted to the SFDPH, which will be responsible for including the updated information on their SFDPH HPS Redevelopment website.

2. ENVIRONMENTAL CONDITION OF THE PROPERTY

The environmental condition of Parcels B-1, C and UC-2 are summarized in the following Sections. The HPS information repositories also contain the documents discussed in Section 2 and elsewhere in this Restricted Activities Work Plan. The HPS repositories are maintained as follows:

San Francisco Main Library
100 Larkin Street
Government Information Center, 5th Floor
San Francisco, California 94102
Phone: 415-557-4500

Bayview/Anna E. Waden Branch Library
5075 Third Street
San Francisco, California 94124
Phone: 415-355-5757

DTSC file room
700 Heinz Avenue
Berkeley, CA 94710.
Phone: 510-540-3800

2.1 Parcel B-1

Industrial and radiological research activities conducted by the Navy or other tenants at Parcel B-1 have resulted in metals (primarily arsenic and manganese), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyls (PCBs) in soil; VOCs (primarily trichloroethene (TCE) and its degradation product vinyl chloride) in groundwater; volatile chemicals, primarily TCE and vinyl chloride, in soil gas near Building 123; and radionuclides in structures (such as buildings, storm drains, and sanitary sewers) and in soil. Notable environmental conditions in Parcel B-1 in the vicinity of the project Site are depicted in Figure 4.

Installation Restoration (IR) site IR-42 is located within the HPAP Site boundaries (Figure 4). IR-42 includes Building 109 (a former Police Station), Building 113 (a former Tug Maintenance Shop and Salvage Divers Shop), and Building 113A (a former Machine Shop, Torpedo Maintenance Shop, Tug Maintenance Shop, and Electrical Substation). Chemicals of concern identified at IR-42 include metals, SVOCs, and PCBs. From the information gathered during the remedial investigation, feasibility study and RA, the possible sources were identified to be naturally occurring or

anthropogenic metals and petroleum-related contamination. Approximately 300 cubic yards of soil were removed as part of the RA. The amended ROD (Navy, 2009) and the Technical Memorandum in Support of a ROD Amendment (ChaduxTt, 2007) for Parcel B-1 provide more details on the nature and extent of contamination in IR-42.

The RA in Parcel B-1 was completed in 2012. The remedy for soil and groundwater at Parcel B-1 includes: 1) excavations to remove soil in selected areas where chemicals of concern (COCs) exceed remedial goals (RGs) based on planned reuse; 2) installation of Durable Covers including a two-foot thick layer of clean soil, asphaltic concrete (AC); 3) repair of existing building foundations; 4) expansion of a soil vapor extraction (SVE) system; and 5) injection of polylactate into the groundwater as described in the final RACR (ERRG, 2014b). The remedial action work that was conducted within the limits of the HPAP project area includes excavations and installation of the Durable Cover. The Durable Cover provides a physical barrier to prevent exposure of humans and wildlife to residual COCs in soil.

2.2 Parcel C

Industrial and radiological research activities conducted by the Navy or other tenants at Parcel C have resulted in metals (primarily arsenic, lead, zinc and manganese), polycyclic aromatic hydrocarbons (PAHs), VOCs, and PCBs in soil; VOCs, SVOCs, PAHs, and metals (especially hexavalent chromium [Cr6+] and zinc) in groundwater; and radionuclides in structures (such as buildings) and in soil. Notable environmental conditions occurring in Parcel C in the vicinity of the project Site are depicted in Figure 5.

The selected remedies that are being or have been implemented in Parcel C include: 1) excavations to remove soil in selected areas where COCs exceed RGs based on planned reuse; 2) SVE to address VOC-contaminated soil and soil gas above groundwater plumes; and 3) Durable Covers to cut off potential exposure to ubiquitous metals and any remaining COCs in soil. The RA work that was conducted within the limits of the HPAP project area includes excavations, SVE, monitored natural attenuation (groundwater only), and installation of the Durable Cover. Durable Covers will include existing asphalt and concrete surfaces, buildings, and engineered soil covers. The Durable Covers will be installed in accordance with the Parcel C Remedial Design (CH2M HILL Kleinfelder, A Joint Venture [KCH], 2012).

2.3 Parcel UC-2

Parcel UC-2 includes portions of Fisher Avenue and Robinson Street and is bounded on the north, east, and south by Parcel C and on the west by Parcel UC-1 and former Parcel A. Most of the area associated with Parcel UC-2 has historically been a paved roadway or parking area. Historical use of the southern portion of Parcel UC-2 is as a roadway (Fisher Avenue), and the northern portion is as a triangularly shaped parking lot. The property is mostly paved, except for the steep unpaved hillside bordering Fisher Avenue, which is covered by vegetation (ChaduxTt, 2013).

Certain COCs remain in soil, soil vapor, and groundwater at Parcel UC-2 at levels and in conditions that the FFA Signatories have determined are consistent with the ROD RA Objectives. The COCs that remain in soil at Parcel UC-2 include naturally-occurring metals (specifically, arsenic and manganese) and PAHs (Navy, 2009a and Navy, 2009b). COCs in soil vapor that remain include VOCs, (specifically, benzene, chloroform, and TCE, vinyl chloride and their degradation products; [ChaduxTt, 2013]). Notable environmental conditions are depicted in Figure 6.

Soil Vapor

Parcel UC-2 includes an Area Requiring Institutional Controls (ARIC) for VOCs in soil vapor as identified on Figure 5. Utility work in these areas must comply with standards and protocols as set forth in Sections 5.7.2 and 5.7.3 of the RMP. No enclosed structures are planned for the ARIC for VOCs in soil vapor.

Groundwater

COCs in groundwater in Parcel UC-2 include carbon tetrachloride and chloroform; they are not present at levels that pose a health risk from dermal exposure and inhalation to construction workers (Navy, 2009a and Navy, 2009b). Carbon tetrachloride and chloroform have been detected in groundwater but have not been associated with an identified source (Figure 6). Except for this localized area, Parcel UC-2 is upgradient of other areas of groundwater contamination at HPS. The ROD for Parcel UC-2 selected monitored natural attenuation as the remedy for the low concentrations of carbon tetrachloride and chloroform in groundwater in the vicinity of groundwater remediation performance monitoring wells IR06MW54F and IR06MW55F. Groundwater is currently being monitored by the Navy in remediation performance monitoring wells

IR06MW54F and IR06MW55F as a component of the Basewide Groundwater Monitoring Program. The most recent groundwater monitoring results indicate that concentrations of chloroform and carbon tetrachloride slightly exceed remediation goals (Navy, 2014). Soil vapor sampling results collected in this area in 2010 identified that concentrations were below the level that would pose a risk to potential future residential receptors via vapor intrusion under documented site conditions. Work in these areas must comply with standards and protocols as set forth in Section 4.10.

Components of the remedy that remain to ensure that human health and environment are protected from potential long-term health risks include:

- Durable Covers over the entire Parcel to prevent contact with residual ubiquitous metals. The Parcel UC-2 Durable Cover is defined as hardscape (e.g., asphalt, building foundations, concrete pads, sidewalks, etc.) or two feet of clean imported soil fill in the RODs (Navy, 2009a and Navy, 2009b), RD (Navy, 2010a), and RAWP (Navy, 2012).
- Groundwater monitoring at two wells in Parcel UC-2 to verify that natural attenuation continues to progress and to meet the RGs defined in the UC-2 ROD (Navy, 2009a).
- Land use and activity restrictions and ICs, implemented through a CRUP and federal quitclaim deed, to prevent or minimize exposure to residual COCs in the soil, soil gas, and groundwater. The entire Parcel includes restrictions related to the durable cover (General Area Requiring Institutional Controls or ARIC) and a portion of the Parcel includes restrictions related to VOCs in soil vapor (ARIC for VOCs in soil vapor).

The requirements for inspection, maintenance, and reporting of these components of the remedy are provided in the O&M Plan for Parcels UC-1 and UC-2 (Navy, 2013).

The radiological corrective actions in Parcel UC-2 are complete, and no radiological restrictions remain on Parcel UC-2. California Department of Public Health (CDPH) issued the Radiological Unrestricted Release Recommendation for Parcel UC-2 in 2011 stating that Parcel UC-2 is suitable for unrestricted use with respect to radiological constituents (DTSC, 2011).

3. WORK TO BE CONDUCTED

Most of the HPAP project work lies within Parcel A. The HPAP construction work on Parcels B-1, C, and UC-2 involves clearing and grubbing vegetation, demolition of one building and hardscape, demolition of existing utilities, grading, and the construction of new utilities, streets, sidewalks, and landscaping and the new Artists' Building.

This section identifies the construction activities proposed in Parcels B-1, C, and UC-2 and describes how construction will impact the approved remedies. Work to be performed on each Parcel is summarized as follows:

- **Parcel B-1**: Work includes demolition of Building 109, its foundation, and associated utilities; clearing and grubbing of vegetation; removal of approximately 75 linear feet of Robinson Street and associated curb, gutter and sidewalk; removal of above grade structures and below grade utilities; excavation and rough grading of the existing ground surface; paving of a new roadway; and installation of a soil cover and landscaped areas.
- **Parcel C**: Work includes removal of approximately 380 linear feet of Robinson Street and the associated curb, gutter and sidewalk, clearing and grubbing of vegetation, removal of above grade structures, and below grade utilities, excavation and rough grading of the existing ground surface, installation of temporary utilities, paving of a new roadway; the installation of a stormwater conveyance culvert; and installation of a soil cover and landscaped areas.
- **Parcel UC-2**: Work includes removal of approximately 380 linear feet of Robinson Street and 25 linear feet of Horne Avenue along with the associated curb, gutter and sidewalk, clearing and grubbing of vegetation; removal of above grade structures, and below grade utilities; excavation and rough grading of the existing ground surface; installation of utility corridors; paving of a new roadway; construction of the northeast portion of the new Artists' Building; abandonment and reinstallation of groundwater monitoring wells IR06MW54F and IR06MW55F, while protecting well IR06MW56F in place; and, installation of a soil Durable Cover and landscaped areas.

The work described above will involve conducting Restricted Activities, as defined in the LUCRD and CRUP for Parcels B-1, C, and UC-2. Specifically, Restricted Activities will include the following:

- **Durable Cover:** Site demolition and mass grading activities will disturb the Durable Cover installed by the Navy in Parcels B-1 and UC-2. Durable Covers that will be affected in Parcel B-1 include the Building 109 foundation, soil cover, and asphalt cover. Durable Covers that will be affected in Parcel UC-2 include soil cover and asphalt cover (Figure 7). Durable Cover construction will be conducted as described in Section 4.3 of this Work Plan.
- **Soil Management**: Grading and earthwork, described above, will result in HPS Bay Fill and Native soil/bedrock being graded and relocated from its current location. HPS Bay Fill as defined in the RMP is a non-native historically imported fill that was placed bay ward of the original shoreline and/or placed on top of native bedrock and soil to create the current footprint of HPS. The HPS Bay Fill and Native soil/bedrock potentially contains naturally occurring asbestos and naturally occurring metals. Where possible, HPS Bay Fill and native soil will be placed under a Durable Cover that is constructed in conjunction with this project. Surplus soil that cannot be placed under a Durable Cover associated with this project will be stockpiled in Parcel G (Figure 8). Soil handling and stockpiling will be conducted in accordance with the protocol described in Section 4.5.
- **Groundwater Monitoring Wells**: Demolition, grading, and construction activities will impact existing groundwater monitoring wells in Parcel UC-2. Some monitoring wells will require relocation and some well heads will require modification to adjust to the new ground surface. Work affecting groundwater monitoring wells will be conducted in accordance with the protocol described in Section 4.12. It is anticipated that work will affect Parcel UC-2 wells IR06MW54F, IR06MW55F, and IR06MW56F.
- **COCs in Groundwater**: Because significant earthwork will take place in Parcel UC-2 within 100 feet of the existing remediation performance monitoring wells IR06MW54F and IR06MW55F (see Section 2.0) where residual levels of VOCs exist in groundwater, a soil vapor assessment or vapor intrusion mitigation will be required for Inhabited Buildings that are proposed to be constructed within 100 feet of these remediation performance monitoring wells, even though that area is not designated as a VOC ARIC. This work would follow the protocol outlined in Section 4.10.2 of this Work Plan.

- **Soil Vapor ARIC**: Demolition, grading, and construction work will occur in the portion of UC-2 that is designated as an ARIC for VOC vapors in soil. Utility work and Inhabited Buildings constructed within the VOC ARIC must follow the protocol outlined in Section 4.10.1 of this Work Plan.

Construction activities are scheduled to commence on 28 August 2015 and be completed by January 2017. A copy of the current tentative construction schedule is included in Appendix A. Removal of the existing Durable Cover components is scheduled to commence on 18 September 2015. The date that the Durable Cover is expected to be completely restored is estimated to be 6 January 2017. This will account for a period of 15 months that the Durable Cover will not be in place. During this period of time, the Site access will be controlled, as described in Section 4. 2, dust control and real-time monitoring will be conducted, as described in Section 4.5, and stormwater runoff will be managed under a Storm Water Pollution Prevention Plan (SWPPP), as described in Section 4.7.

4. RISK MANAGEMENT MEASURES DURING RESTRICTED ACTIVITIES

4.1 Construction Worker Health and Safety Plan

Construction contractors, maintenance contractors, and utility contractors whose workers may contact potentially contaminated soil, soil vapor, or groundwater from the Site, are required to prepare site-specific Environmental Health and Safety Plans (EHSPs) under the direction of a Certified Industrial Hygienist (CIH) and in a manner consistent with applicable occupational health and safety standards, including, but not limited to Occupational Safety and Health Administration (OSHA) regulation OSHA 1910.120. The contractor-specific EHSPs will be maintained by the contractor at the Site. Nothing in this section is intended to relieve any person, including contractors or employers, of other mandated worker health and safety planning and training requirements under any federal, state, or local statute or regulations.

It is the responsibility of the contractor preparing their EHSP to review information available in the HPS information repositories (see Section 2.0) regarding site conditions and associated potential health and safety concerns (see Section 2.0 for each Parcel). It is also the responsibility of the contractor or other person preparing an EHSP to verify that the components of the EHSP are consistent with applicable Cal/OSHA occupational health and safety standards and currently available toxicological information for potential COCs at the work site. Contractor compliance with the RMP obligations will be specified in the contract documentation for the contractors performing subsurface work. Each contractor must require its employees who may directly contact potentially contaminated Site soil or groundwater to perform all activities in accordance with the contractor's EHSP. Each construction contractor will assure that its onsite construction workers will have the appropriate level of health and safety training, site-specific training, and will use the appropriate level of personal protective equipment (PPE) as determined in the relevant EHSP based upon the evaluated job hazards and monitoring results. An example EHSP outline is included in Appendix B.

4.2 Construction Site Access and Control

Access to the site during construction activities will be limited to authorized personnel in compliance with EHSP requirements (Section 4.1). The potential for trespassers or

visitors to gain access to construction areas and come into direct contact with potentially contaminated soil or groundwater will be controlled through the implementation of the following access and perimeter security measures:

- Except in streets, security fencing will be placed around any Site without a FFA Signatory approved Durable Cover or where the Durable Cover has been disturbed to prevent pedestrian/vehicular entry except at controlled (gated) points. Gates will be closed and locked during non-construction hours. Fencing will consist of a 6-foot chain link or equivalent fence unless particular safety considerations warrant the use of a higher fence. Use of fences during small routine maintenance activities will be determined in the EHSP.
- In streets, use a combination of K-rails or similar barriers and fences with locked gates.
- Post "No Trespassing" signs every 200 feet.
- Post signs every 200 feet warning that the area within the fenced areas may contain chemicals that may be harmful to human health.
- "No Trespassing" and warning signs should be in multiple languages commonly spoken in the local community and should include a phone contact.

Implementation of appropriate site-specific measures as outlined above will reduce the potential for trespassers or visitors to gain access to construction areas and to come into direct contact with soil or groundwater. Compliance with the specific access control measures is the responsibility of the Owner and General Contractor.

4.3 Durable Cover Protocols

This Section presents protocols to be followed when temporarily removing and then replacing the Durable Cover during Restricted Activities in Parcels B-1 and UC-2. Durable Covers include existing concrete building foundations, asphalt, concrete covers (e.g., existing roads and paved parking areas), and soil covers with a minimum thickness of two feet. Where HPAP construction work requires the temporary removal and eventual replacement of the Durable Cover, then the protocol presented in this Section will be followed. All land-disturbing activity where the existing Durable Cover has been removed and HPS Bay Fill and/or Native soil is exposed will follow the protocol for access control (Section 4.2), the Combined Asbestos Dust Monitoring Plan

(ADMP) and Dust Control Plan (DCP) (Section 4.4.2 and Appendix C), and the construction SWPPP (Section 4.7). Construction of new Durable Covers will comply with the specifications presented in the Navy RD reports specific to the area of work, the construction documents, and local building codes and ordinances. A general summary of these requirements is presented in Sections 4.3.1 and 4.3.2. Figure 7 presents the planned final cover configuration in the area of work addressed in this Work Plan.

4.3.1 Soil Cover

When digging in areas of existing soil Durable Covers, workers will remove any existing soil Durable Cover material and segregate from any removed HPS Bay fill/Native Soil. (HPS Bay Fill and Native Soil may be combined as the two will probably be indistinguishable). Any removed HPS Bay Fill/Native Soil will be stockpiled in the designated stockpile area (see Figure 8) and managed in accordance with the stockpile management protocols described in Section 4.4.1 of this Work Plan. A separate stockpile will be maintained for removed soil Durable Cover material for its eventual reuse as a new soil Durable Cover or incorporated into the HPS Bay Fill/Native Soil stockpile.

A new soil Durable Cover will be installed in portions of Parcels B-1, C and UC-2 (Figure 7). Figure 9 provides cross-sectional soil Durable Cover detail. Specifically, a soil Durable Cover will be installed at the following locations:

- The area in the vicinity of Building 109 (Parcel B-1);
- The vegetated slope north of the Horne Avenue and Robinson Street intersection (Parcels B-1 and C);
- The vegetated slope north of Robinson Street (Parcel C);
- The vegetated storm drain swale (Parcel C); and
- The landscape areas near the new Artists' Building (Parcel UC-2).

Soil covers will be constructed in accordance with the specifications identified in the Parcels B-1, C, and UC-2 RDs (ChaduxTt, 2010a and 2012; KCH, 2012; and ChaduxTt, 2010b). A minimum 2-feet thick cover of clean imported soil will be placed over existing native soils and slopes or excavations into native soil where previous Durable

Covers were removed in accordance with the Parcels B-1 and UC-2 RDs (ChaduxTt, 2010a and 2012; KCH, 2012; and ChaduxTt, 2010b). The existing slopes will be excavated along the boundaries of the soil cover area to allow the soil cover to slope to meet the existing grade along Robinson Street.

The existing slopes in Parcel C will be excavated along the toe of the slope to allow the soil cover to slope and meet the final grade. Existing features, such as utility poles or concrete walls, will be protected throughout construction of the soil Durable Cover. Controls will be implemented to prevent erosion and preserve the integrity of the slope until stabilization is achieved through vegetation.

A Construction SWPPP will be submitted under separate cover and will describe the temporary and construction erosion controls (see Section 4.7). Details regarding clearing and grubbing, earthwork, placement and compaction of soil, and installation of erosion controls are presented in the construction documents. Import fill material will comply with the Soil Impact Plan (SIP) (Appendix D) and the geotechnical requirements provided in the Construction Documents.

When construction is complete, the Owner will document that the soil Durable Cover was replaced with either the clean segregated soil or with 2 feet of imported clean soil that meets the SIP requirements. Annual Report documentation will include photographs of the work, measured Durable Cover thickness, an elevation survey, and a statement signed by the person(s) performing the maintenance activities that the work was completed as per this Durable Cover Protocol.

4.3.2 Asphalt and Concrete Durable Cover

A new asphalt and concrete Durable Cover will be installed in Parcels B-1, UC-2 and C at the intersection of Horne Avenue and Robinson Street (Figure 7). Figure 9 provides cross-sectional detail for the asphalt and concrete Durable Covers. Specifically the new asphalt and concrete Durable Covers will be installed in the following areas:

- The new alignment of Robinson Street (Parcel C and UC-2);
- The new alignment of the Horne Avenue and Robinson Street intersection (Parcels B-1 and C); and

- The northeast portion of the new Artists' Building foundation and associated concrete walkways (Parcel UC-2).

The asphalt and concrete Durable Covers will be constructed in accordance with the Parcels B, C, and UC-2 RD (ChaduxTt, 2010a and 2012; KCH, 2012; and ChaduxTt, 2010b and the Construction Documents). Imported fill and sub-base material will comply with the SIP (Appendix D) and the geotechnical requirements provided in the Construction Documents.

4.4 Soil Management

The General Contractor will comply with the requirements for all soil management activities as specified in this Section and the Construction Documents.

HPS Bay Fill and native soil located on Parcels B-1, C and UC-2 may be moved within any portion of the work area and soil from Parcel A may be moved within any portion of the work area, provided the soil is ultimately placed under a Durable Cover. HPS Bay Fill as defined in the RMP is a non-native historically imported fill that was placed bay ward of the original shoreline and/or placed on top of native bedrock and soil to create the current footprint of HPS. The HPS Bay Fill and Native soil/bedrock potentially contains naturally occurring asbestos and naturally occurring metals. In the event that placement of soil underneath the required Durable Cover cannot be accomplished, such soil will be stockpiled within the Site, with adequate protection, as further described in Section 4.4.1 below, or removed from the Site for offsite disposal. Soil will be designated for offsite disposal, only when there is a surplus of soil from mass grading or if it constitutes an unexpected condition as described in Section 4.8. Guidelines for off-site disposal are provided in Section 4.4.4, below.

4.4.1 Soil Stockpile Management Protocols

Stockpiling of excavated HPS Bay Fill and/or Native Soil may be necessary on a temporary basis to support the logistical phasing of the redevelopment activities. Soil stockpiles generated as a result of this project will be located in an open area in the southeast corner of Parcel G (Figure 8). Stockpiles that contain contaminated soil will be placed on a physical barrier that prevents the contamination of the underlying soil. Examples of a physical barrier are a plastic membrane, concrete surface, or asphalt surface. Stockpiles will be labeled, covered, and monitored as documented in the DCP

(Appendix C) to prevent the windblown transport of contaminated dust from the stockpile.

Management of stockpiles containing hazardous substances and/or petroleum substances will include Site access control, storm water runoff control, and dust control requirements identified in this Work Plan. Access control will be accomplished as outlined in Section 4.2 of this Work Plan. Storm water runoff requirements will be specified in a project-specific SWPPP as identified in Section 4.5 of this Work Plan. The DCP that will apply to all work is summarized below, and the detailed plan is included in Appendix C.

Stockpiles will be under control of the Owner at all times and inspected/monitored as specified in the SWPPP and DCP to ensure access control, dust control, and runoff control measures are functioning adequately. At a minimum, stockpiles will be monitored by the contractor at least weekly to verify that the various controls are in place and functioning as intended.

4.4.2 Dust Emissions

Dust emissions are regulated under the San Francisco Health Code, Article 31. The DCP prepared for the Site identifies the measures that will be taken to reduce particulate emissions during demolition of existing structures, grading, soil handling and stockpiling, vehicle loading, utility work, truck traffic and construction of site infrastructure. The DCP has been prepared in accordance with the requirements in Article 31 of the San Francisco Health Code and certain BAAQMD regulations often applicable to redevelopment activities. Exposure of onsite construction workers to dust containing COCs will be minimized, and generation of nuisance dust will also be minimized to comply with Article 31 of the San Francisco Health Code. The DCP is attached as Appendix C.

Naturally Occurring Asbestos (NOA) has been found in the serpentine bedrock and soil throughout the HPS area. Large construction projects occurring within these areas are subject to the California Air Resources Board ATCM. For projects where surface soil will be disturbed in an area of one acre or larger (as defined in the ATCM), an ADMP approved by the BAAQMD is required. Due to the size of land that will be affected by the planned construction work, the suspected presence of NOA in the fill, and the

proximity to NOA-containing bedrock, an ADMP has been prepared for this Site and incorporated into the DCP in Appendix C.

4.4.3 Soil Import Criteria

All soil imported from areas outside HPS will be subject to sampling and soil quality controls established in a SIP. A SIP has been prepared for the HPAP and is included as Appendix D. The SIP is consistent with the most current version of DTSC's October 2001 Clean Imported Fill Material Information Advisory. Soil import criteria will meet the most stringent of the most recent revision of the USEPA Regional Screening Levels (RSLs) for residential soils (USEPA, May 2014), the California RWQCB Environmental Screening Levels (ESLs) (RWQCB, December 2013), or the DTSC soil screening levels that are applicable at the time work is being conducted. For Total Petroleum Hydrocarbons (TPH), the soil import criteria will meet the most recent Tier 1 ESL for TPH as gasoline, diesel, and motor oil, respectively. Soil with COC concentrations that are equal to or below their respective RSL or Tier 1 ESL is approved for import and will be suitable for use as a Durable Cover and/or general fill at the Site.

4.4.4 Offsite Disposal of Soil and Wastes

Offsite soil disposal is not anticipated during this project; however, offsite disposal will be subject to all applicable federal and state laws and regulations. All activities associated with waste disposal, such as truck loading, truck traffic, and decontamination of trucks leaving the facility will be performed in accordance with the applicable protocol outlined in this Section 4.

CP DevCo and the General Contractor are responsible for characterization of waste prior to transportation and offsite disposal. Characterization for disposal will be in accordance with the requirements of Title 22 of the California Code of Regulations (CCR), Division 4.5, Chapter 11 and the requirements of the disposal facility and any other applicable law. Labeling requirements for transportation of waste will be in accordance with Title 29 of the Code of Federal Regulations (CFR), Parts 172 and 173 and any other applicable law.

Soil to be disposed of will be taken only to a certified and permitted California landfill or an equivalent out-of-state landfill, as appropriate and as determined by the waste profile.

4.5 Construction Storm Water Management

A Construction SWPPP will be required prior to the start of the project. The Construction SWPPP will describe the storm water pollution prevention measures and must conform to the requirements of the California State Water Resource Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS00002, Waste Discharge Requirements (WDRs) for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities. Because the permittee must own the title to the land, CP DevCo will apply for coverage under the statewide general permit as the permittee. Compliance with the SWPPP will be the responsibility of the General Contractor and maintained throughout the duration of the construction work. The SWPPP will be prepared by a Qualified SWPPP Developer (QSD) per Section VII of the 2009-0009-DWQ Permit, available at the following website:

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/construction.shtml

The General Contractor shall retain a QSD who will work with CP DevCo to file the required project record documents, including a Notice of Intent (NOI) with the SWRCB prior to commencement of construction work. The QSD shall make all decisions pertaining to this permit with oversight by CP DevCo.

4.6 Soil Vapor Management Protocols

As documented in Section 2, ARICs for VOC vapors in soil have been designated in Parcel UC-2. In addition, one localized area has been identified in UC-2 where VOCs remain in groundwater at concentrations that could pose potential vapor intrusion concerns for inhabited buildings if existing site conditions are altered. Soil vapor management protocols for each of these conditions are addressed in the following sub-Sections.

4.6.1 ARIC for VOC Vapors Protocol

The areas designated as ARICs for VOC vapors in soil are depicted on Figure 6. The planned construction does not involve the new construction or rehabilitation of inhabited buildings within the ARICs for VOC vapors in soil, so soil vapor controls associated with inhabited buildings within ARICs for VOC vapors do not apply to this project. The planned construction does involve the installation of utilities within the ARICs for VOC vapors beneath Fischer Avenue west of the new Commercial Kitchen. The new utilities will be installed in a manner to prevent the migration of vapors through the backfilled material in the utility trench. Engineering controls will be implemented to mitigate the potential for COCs in soil vapors and/or groundwater to migrate along utility corridors. Mitigation measures will include:

- Selecting piping materials that are compatible with the geochemical conditions of the subsurface to ensure the integrity of the piping when in contact with known COCs.
- Sealing pipe joints of non-pressurized utilities (e.g., sanitary sewer, storm drain, etc.) to prevent COCs in groundwater or soil vapor from entering the buried piping;
- Installing impermeable trench plugs at intervals of 200 linear feet along new utility corridors. The plugs will encompass the width and depth of the utility trench and have a length of 2 feet, as shown in Figure 10. The plug will be comprised of a cement slurry (two-sack mix) containing 2% bentonite.

Subsurface dry utilities entering the buildings (e.g., telephone and electrical conduit) will require the installation of a silicone sealant within the conduit at the point of entry into the building. Non-pressurized utilities (e.g., sewer, storm drains, etc.) may require the use of wet "P-traps" and/or air tight piping (e.g., solvent-joined polyvinyl chloride [PVC]) to minimize vapor migration into the pipes and then into the proposed building structure. Details regarding the utility construction and VOC mitigation measures will be documented in the Construction Drawings.

4.6.2 Vapor Intrusion Assessment and Protocol for VOCs in Groundwater

Because significant earthwork and construction of the east wing of the Artists' Building will take place in Parcel UC-2 within 100 feet of the existing remediation performance

monitoring well IR06MW54F (see Section 2.0) where residual levels of VOCs exist in groundwater, a preliminary vapor intrusion assessment was conducted. The assessment was conducted to identify the potential for VOCs in groundwater to pose a vapor intrusion risk to the future occupants of the new Artists' Building. A detailed presentation of the vapor intrusion assessment is presented in Appendix E. In summary, the assessment considered three scenarios as follows:

- **Baseline Scenario:** The Baseline Scenario assesses the vapor intrusion risk assuming a new building was built on the existing ground surface. This scenario assumes the depth to groundwater containing VOCs is approximately 35 feet below existing ground surface (bgs), as documented in the Navy's 3Q2014 Basewide Groundwater Monitoring Report (Navy, 2014).
- **Development Scenario A**: Development Scenario A assesses the vapor intrusion risk assuming that the existing ground surface is excavated approximately 15 feet to a new elevation of 20 feet above mean sea level, as indicated on the construction drawings, and groundwater remains at an elevation consistent with that reported in the Navy's 3Q2014 Basewide Groundwater Monitoring Report (Navy 2014).
- **Development Scenario B**: Development Scenario B assesses the vapor intrusion risk assuming that the existing ground surface is excavated approximately 15 feet to a new elevation of 20 feet above mean sea level, as indicated on the construction drawings, and groundwater containing VOCs rises to an elevation that is 1 ½ feet below the new land surface.

The assessment approach conservatively considered the VOCs chloroform and carbon tetrachloride at the maximum concentration reported by the Navy in its Basewide Groundwater Monitoring program. Results of the assessment are as follows:

Scenario	Cumulative Risk	Hazard Index
Baseline	4×10^{-7}	Less than 1
Development Scenario A	3×10^{-6}	Less than 1
Development Scenario B	4×10^{-6}	Less than 1

The results for the Baseline Scenario (current conditions) are below the minimum cumulative risk threshold of 1×10^{-6} and the results for development Scenarios A and B only slightly exceed the threshold.

As a result of the preliminary vapor intrusion assessment, CP DevCo has elected to perform a soil vapor sampling investigation to identify the current presence of VOCs in soil vapor beneath the Artists Building. A Draft Activities Specific Work Plan for the soil vapor investigation was submitted under separate cover to FFA Signatories on 3 March 2015. CP DevCo also elected to voluntarily evaluate the need for installtion of a sub-slab passive venting system beneath the eastern portion of the new Artists' Building (Figure 11). If necessary, the sub-slab passive venting system will be constructed to form a nominal 4-inch vented space beneath the building floor slab. The space will be passively vented to the atmosphere through vent pipes that exhaust to the atmosphere above the roof line. A schematic of the system is presented in Figure 12. If necessary, detailed design and construction drawings of the system will be submitted for FFA Signatory approval following completion of the soil vapor sampling investigation under separate cover.

4.7 Groundwater Management Protocols

As described in Section 2.0, VOCs are present in localized areas of groundwater within the work area in Parcel UC-2. However, the project plan does not currently call for excavation below the existing groundwater table, and no construction dewatering is anticipated. If excavation below the groundwater surface and construction dewatering is anticipated, a Groundwater Management Plan will be submitted under separate cover for review and approval by the FFA Signatories. The Plan will determine the appropriate protective measures to address worker safety and prevent the movement or spreading of any residual VOCs in groundwater. If perched water or groundwater is unexpectedly encountered during construction, the contractor will follow the protocol outlined in the Unexpected Conditions Response Plan (UCRP) presented in Section 4.8.

4.7.1 Groundwater Monitoring Wells

As described in Section 2.0, groundwater monitoring is being conducted by the Navy at wells IR06MW54F, IR06MW55F, and IR06MW56F in accordance with the ROD for Parcel UC-2. Site grading activities will impact these three wellss. To provide for continued long-term monitoring of these wells by the Navy, the existing wells will be abandoned (removed) prior to grading activities commence and be replaced (installed) as close to their original location once the final grade and new durable cover has been established. The location of these wells is depicted in Figure 6 and the current well construction diagrams are included in Appendix F. Monitoring well modifications will be coordinated with the Navy base-wide groundwater monitoring contractor to ensure that any changes made to well casing elevations are coordinated with scheduled sampling events, are documented appropriately, and that well completions are satisfactory.

4.7.2 Modification/Abandonment of Existing Monitoring Wells

An attempt will be made to modify the existing wells such that the well heads will be completed at the new ground elevation without having to disturb or abandon the entire existing well. Based on the grading plan, it is anticipated that at least one of the surface completions can be adjusted to meet the final cover grade without removing the well (well IR06MW56F). Initially, a plug or packer will be placed inside the well casing at the new surface elevation to prevent soil or other foreign matter from being introduced into the screened portion of the well. Following placement of the plug, a work exclusion zone will be demarcated around the well. As excavation progresses in the immediate area with mechanized equipment, the area around the existing well casing will be hand excavated. It is expected that excavation will likely be less than 3 feet in this area. Upon reaching the new ground surface elevation, the well casing will be cutoff and the well head completed with a new surface seal and monument box.

The remaining two wells (IR06MW54F and IR06MW55F) will be abandoned and replaced. The existing groundwater monitoring wells will be abandoned in accordance with applicable State and SFDPH regulations. Prior to abandonment, the well locations will be surveyed by a licensed surveyor so that the replacement wells can be installed as close to the same location as possible. CP DevCo is responsible for surveying and obtaining all appropriate permits and approvals for well abandonment.

4.7.3 Groundwater Monitoring Well Replacement

The groundwater monitoring wells will be re-installed within 60 days of the prior well's abandonment date unless the FFA Signatories grant an extension due to conflicts with the construction schedule.

Replacement wells will be located within five feet of the original abandoned well in a cross- or down-gradient location, constructed in the same manner as the original well, and will monitor, to the extent possible, the same groundwater zone as the original well. The wells will be installed in accordance with the Navy's well installation protocol and in accordance with State and SFDPH groundwater monitoring well requirements. The elevations of the new well heads will be surveyed, and the coordinates recorded during the final post-construction land survey. CP DevCo will be responsible for obtaining all appropriate permits and approvals, and providing notification to the Navy. It will be the responsibility of the Navy to update the Basewide Groundwater Monitoring Plan in response to changes in monitoring well location. The proposed replacement well construction logs are provided in Appendix F.

Following installation of the replacement well(s), a monitoring well abandonment/installation completion report will be submitted to the FFA Signatories. The report will include, but not limited to:

- Well location;
- Identification of driller and drilling procedures;
- Department of Water Resources (DWR) Well Completion Report;
- Decontamination procedures;
- Well modification or abandonment and installation procedures;
- Lithologic log;
- Well development procedures;
- Surveyed horizontal location coordinates and vertical elevation of top of casing;
- Well completion details (depth, screen interval, materials used, materials used, surface completion, etc.);

- Initial water level measurement;
- Permitting information; and,
- Disposition of installation-derived wastes.

The report shall be signed by a Registered Professional.

4.8 Unexpected Conditions Response

An Unexpected Condition is a condition observed in the soil, soil vapor, and/or groundwater that indicates the potential for Hazardous Substances and/or petroleum hydrocarbons to exist beneath the Site at a location that has not previously been identified, characterized, or remediated by the Navy. By way of example, unexpected conditions may include visibly discolored soil, soil exhibiting a chemical odor, the presence of an oily sheen or separate-phase petroleum product in the soil or groundwater, unexpected subsurface structures, radioactive materials, buried munitions or munitions constituents, or other visual or olfactory evidence of a historical release not previously identified. If in the course of evaluating the Unexpected Condition, the soil exhibits a total TPH concentration equal or greater than the Navy's petroleum Source Criterion for soil (3,500 milligrams per kilogram [mg/kg] total-TPH; Shaw 2007), the soil will be managed as if it contains separate-phase petroleum product.

The potential exists for encountering unexpected or unknown subsurface conditions within the Site during development construction. As part of the site-specific health and safety training that will be required of grading contractors and site construction workers (see Section 4.1), instruction will be given on how to identify and respond to potential Unexpected Conditions.

An UCRP has been prepared for the project and identifies how unexpected contamination shall be addressed in consultation with the SFDPH and FFA Signatories. A copy of the UCRP is included in Appendix G. Upon discovery of a potential Unexpected Condition, the Owner shall conduct an initial assessment to identify the nature of the condition. The initial preliminary assessment will be made in accordance with Section 1 of the UCRP. The nature of the condition will be described as one of two categories of conditions, as follows:

- **Category 1 Condition:** A Category 1 Condition could pose an immediate hazard to construction workers and warrants a timely and coordinated response between the contractor, developer, SFDPH, and the FFA Signatories. By way of example, Category 1 Conditions include radioactive materials and material potentially presenting an explosive hazard (MPPEH).
- **Category 2 Condition**: A Category 2 Condition is less likely to represent an immediate hazard to construction workers and warrants a response through the SFDPH in consultation with the FFA Signatories, as appropriate. By way of example, Category 2 Conditions include visual and/or olfactory evidence of hazardous substances and/or petroleum constituents in soil, soil gas, and/or groundwater.

If the condition is determined to be a Category 1 Condition, the Owner will stop work, secure the area, notify the SFDPH and FFA Signatories within 24 hours of designating a Category 1 Condition, and consult with FFA Signatories and the SFDPH to determine the appropriate response action. In the case of radioactive materials, the Owner will consult with SFDPH and FFA Signatories to determine the appropriate response and may request the Navy to take appropriate action. In the case of MPPEH, the Owner will consult with SFDPH and FFA Signatories to determine the appropriate response and, in the case of unexploded ordnance, notify the San Francisco Police Department Bomb Squad to take appropriate action.

If the condition is a Category 2 Condition, the Owner will temporarily suspend work and notify the SFDPH and FFA Signatories of the condition. In making the notification, the Owner will provide any information that it may have regarding the condition. The Owner will then follow the steps outlined in Section 2.2 of the UCRP (Appendix G) in consultation with the SFDPH and FFA Signatories to address the condition.

In accordance with the site-specific EHSP, appropriate measures will be undertaken to ensure worker safety in areas where Unexpected Conditions are encountered. The SSHO will be responsible for performing activity hazard analyses and evaluating any change in site conditions. The SSHO may stop work to determine if the level of site security and PPE is adequate.

5. NOTIFICATIONS AND REPORTING

5.1 Progress Reporting

Throughout the course of the project, CP DevCo will provide progress reporting to the SFDPH and the FFA Signatories, as appropriate, with updates on the progress of the work and compliance with this Work Plan. CP DevCo or its designee will provide progress reporting to the SFDPH and FFA Signatories for the following project milestones:

- Fifteen days prior to breaking ground;
- Five days prior to abandonment of any existing and installation of any replacement groundwater monitoring well;
- Upon completion of excavation activities;
- Upon encountering an Unexpected Condition as defined in Section 4.8; and
- Upon construction completion of the Durable Cover.

Progress reporting will be in the form of an email communication or a phone call followed by a confirming email communication. A list of contacts and contact information is presented in Table 1.

5.2 Final Completion Report

Following completion of the work approved in this Restricted Activities Work Plan, CP DevCo shall prepare and submit a Completion Report to the FFA Signatories and the SFDPH for review and approval. The Completion Report shall, at a minimum, include the following elements:

- A description of the work completed;
- A description of the final condition of the Site, including the configuration of the final Durable Cover;
- A detailed description and as-built drawings of any remedy or mitigation components installed;

- An accounting of the soil and groundwater management activities, including soil and groundwater hauled offsite for disposal, soil imported for filling, and groundwater monitoring well abandonment records and installation reports;
- Records and documentation such as hazardous waste manifests, soil import evaluation documents, NPDES discharge reports, dust and asbestos monitoring documentation, etc.; and
- A modified O&M Plan to include updated O&M provisions necessitated by the work.

The Completion Report may also specify that a separate Restricted Activities Work Plan for future vertical development is not required in designated areas, subject to any site-specific requirements or protocols that are necessary to implement based on the environmental condition of the Site and its configuration following the work that has been performed pursuant to this Work Plan. Such site-specific protocols or requirements may include, but are not limited to, assessment of groundwater and vapor intrusion data beyond what is required in this Work Plan.

6. REFERENCES

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Navy. 2009b. "Final Record of Decision for Parcel UC-2, Hunters Point Shipyard, San Francisco, California." 17 December.

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TriEco-Tt, 2014. Final Finding of Suitability to Transfer for Parcels UC-1 and UC-2, Hunters Point Naval Shipyard, San Francisco, California. October.

TABLES

Geosyntec consultants

Table 1
Contact Information

FAA Signatory Points of Contact

DTSC
Hunters Point Project Manager
Department of Toxic Substances Control
700 Heinz Avenue, Suite 200
Berkeley, CA 94710
Phone: 510-540-3775

RWQCB
Hunters Point Project Manager
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612
Phone: 510-622-3966

U.S. EPA
Hunters Point Project Manager
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, CA 94105
Phone: 415-942-3005

U.S. Navy
BRAC Environmental Coordinator
BRAC Program Management Office West
1455 Frazee Road, Suite 900
San Diego, CA 92108-4310
Phone: 619-532-0913

CP Development Company LLC
Mr. Mark Luckhardt, Project Manager
One Samson Street, Suite 3200
San Francisco, CA 94104
Phone: (415) 247-2933
Mark.Luckhardt@lennar.com

Mr. Jeffrey Martin, Environmental Coordinator
One Samson Street, Suite 3200
San Francisco, CA 94104
Phone: (415) 344-8841
Jeffrey.C.Martin@lennar.com

General Contractor (TBD)

Other Points of Contact

City and County of San Francisco Department of Public Health
Hunters Point Project Manager
1390 Market Street, Suite 210
San Francisco, CA 94102
Phone: 415-252-3800

Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109
Phone: 415-771-6000 | 1-800-HELP AIR

California State Lands Commission
100 Howe Avenue, Suite 100 South
Sacramento, CA 95825
Phone: 916-574-1900

U.S. Army Corps of Engineers
1455 Market Street
San Francisco, CA 94103
Phone: 415-503-6773

U.S. Fish and Wildlife Service
2800 Cottage Way
Sacramento, CA 95825
Phone: 916-414-6464

San Francisco Bay Conservation and Development Commission
50 California Street, Suite 2600
San Francisco, CA 94111
Phone: 415-352-3600

San Francisco Main Library
100 Larkin Street
Government Information Center, 5th Floor
San Francisco, CA 94102
Phone: 415-557-4500

FIGURES

Legend

- Project Boundary
- Navy Parcel Boundary
- License Exemption Requested

N

0 1,000 Feet

Basemap source: ESRI, 2014

Hunters Points Shipyard Parcel Map and Project Location Map

Hunters Point Artist Project
San Francisco, CA

Geosyntec consultants

WR1247A	April 2015

Figure 1

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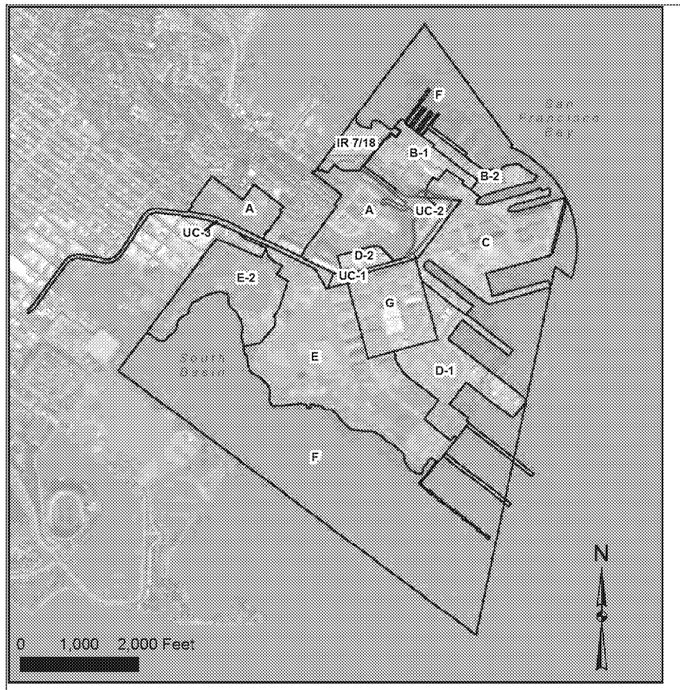

LEGEND:

- NAVY PARCEL BOUNDARY
- IMPACT AREA/LIMIT OF WORK
- PROPOSED CONSTRUCTION FENCE
- NAVY FENCING AROUND S.V.E. AREA
- LIMIT OF WORK WITHIN NAVY PROPERTY

GRAPHIC SCALE

200 0 200 400

Project Boundary Map

Hunters Point Artist Project
San Francisco, California

Geosyntec consultants

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Figure 2

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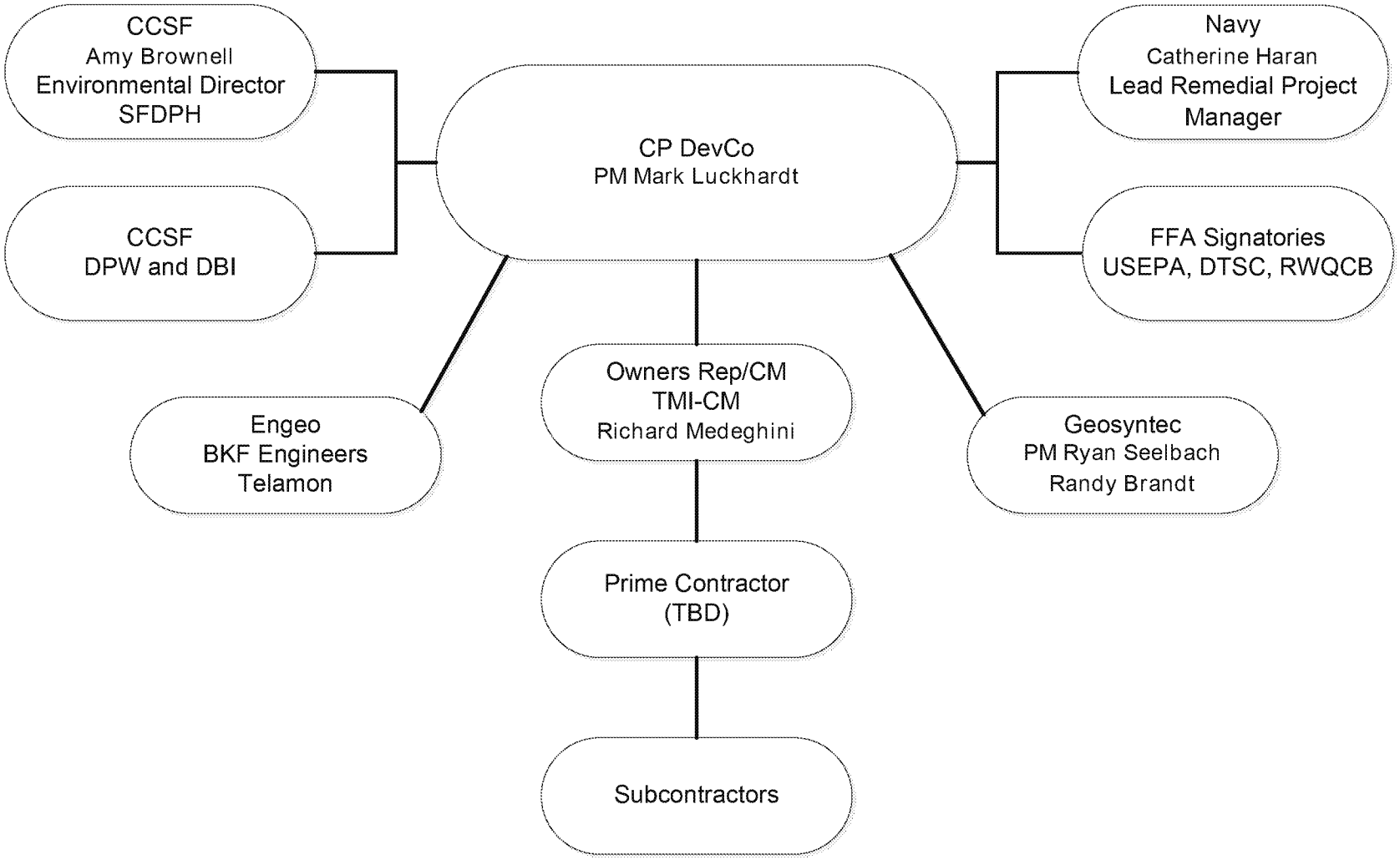

Project Organization Chart
Artist Parcel Work Plan

Hunters Point Artist Project
San Francisco, California

Geosyntec consultants

Figure 3

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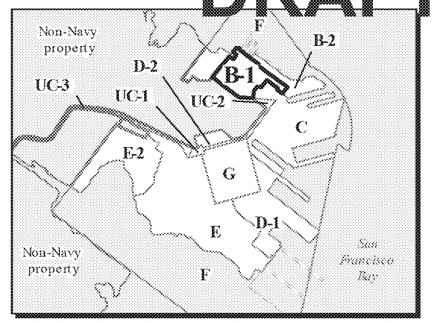

Hunters Point Naval Shipyard Parcels

PARCEL F

IR-07

IR-18

PARCEL B-2

PARCEL C

PARCEL UC-2

FORMER PARCEL A

ARIC Related to VOC Vapors

Area of All Other Restrictions

Parcel B-1 Boundary

IR Sites 07 and 18

Non-Navy Property

Building

San Francisco Bay

ARIC Area Requiring Institutional Controls
IR Installation Restoration
VOC Volatile Organic Compound

0 200 400

Approximate Scale in Feet

Source: 2015 FOST

Parcel B-1 Environmental Conditions

Hunters Point Artist Project
San Francisco, CA

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Figure 4

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DRAFT

Note:
*Selected remedy for these areas is to maintain building footprints (foundations) to serve as surface covers through institutional controls. If the buildings are removed in the future, further action is required to address chemicals present in soil beneath the building footprint. Note that other institutional controls are required for the entire parcel.

PLANNED SOIL REMEDIES

- EXCAVATION AREA
- SOIL VAPOR EXTRACTION AREA
- AREA WITH COCS IN GROUNDWATER

PLANNED SURFACE COVERS

- 231 — BUILDING FOOTPRINT AND NUMBER
- BUILDING AREA REQUIRING INSTITUTIONAL CONTROLS DUE TO CONTAMINATION UNDER FOUNDATION*
- NEW SOIL COVER
- NEW ASPHALT
- REPAIRED ASPHALT
- PARCEL C BOUNDARY
- NON-NAVY PROPERTY

- VOCS (EXCEPT BENZENE)
- BENZENE
- PAHS
- PESTICIDES AND SVOCS (EXCEPT PAHS)
- PCBS (AROCLOR-1254 AND AROCLOR-1260)
- METALS
- WHERE COMMINGLED WITHIN 50 FEET OF OTHER CONTAMINANTS TOTAL TPH ≥ 3,500 MG/KG

mg/kg	MILLIGRAMS PER KILOGRAM
PAH	POLYCYCLIC AROMATIC HYDROCARBON
PCB	POLYCHLORINATED BIPHENYL
SVOC	SEMIVOLATILE ORGANIC COMPOUND
TPH	TOTAL PETROLEUM HYDROCARBON
VOC	VOLATILE ORGANIC COMPOUND
COC	CONTAMINANT OF CONCERN
RG	REMEDIAL GOAL

Note: It is assumed that all soil remediation will be completed before construction.

0 125 250 375 500 Feet

Parcel C Environmental Conditions

Hunters Point Artist Project
San Francisco, CA

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Figure **5**

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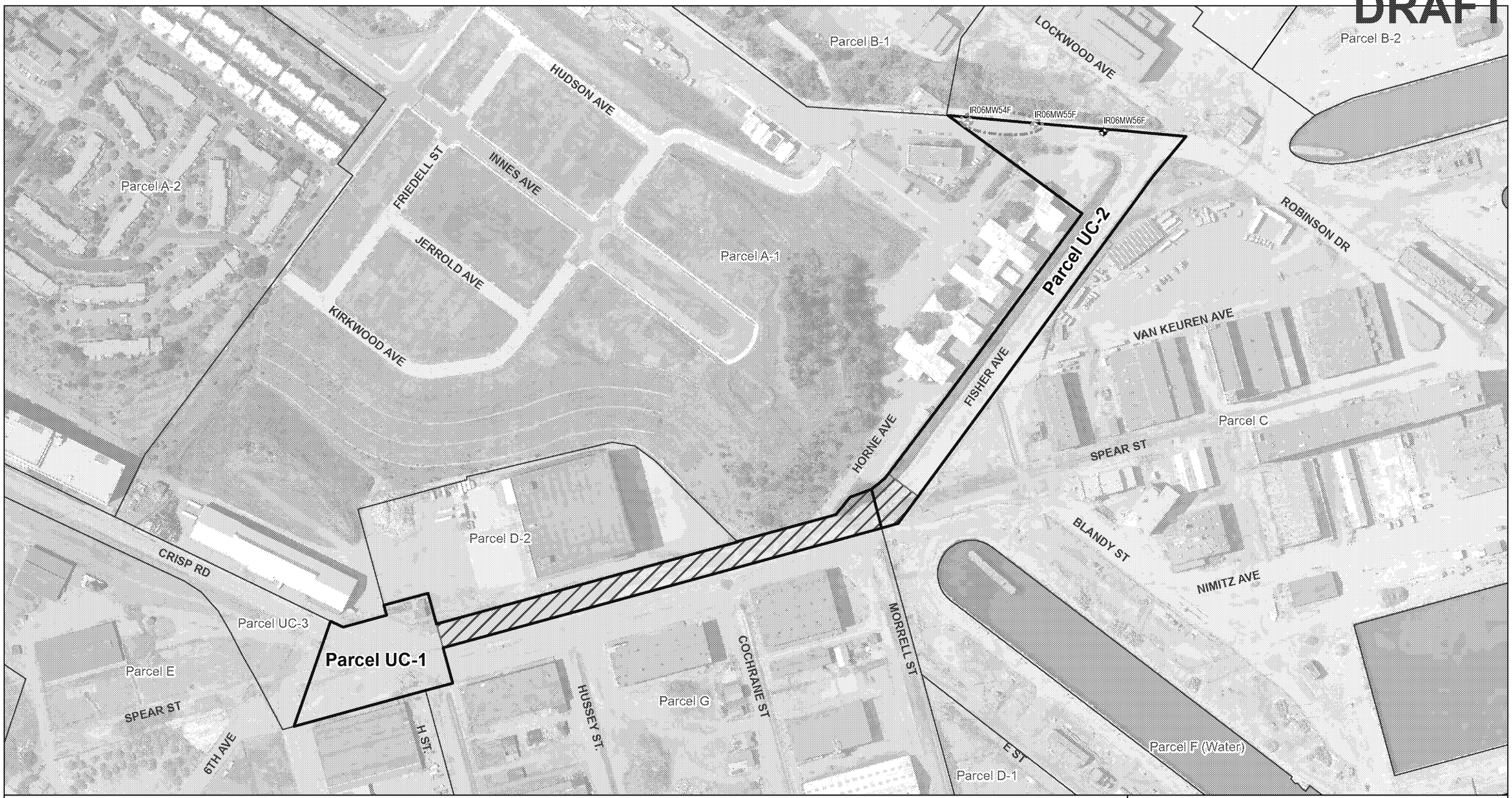

Legend

- Existing Groundwater Monitoring Well
- Remediation Performance Monitoring Well
- Area with COCs in Groundwater
- ARIC for VOC Vapors
- Navy Parcel Boundary

Notes:
ARIC = Area Requiring Institutional Controls
COC = constituent of concern
VOC = volatile organic compound
Basemap source: ESRI, 2014

N

0 240 Feet

Parcels UC-1 and UC-2 Environmental Conditions

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San Francisco, CA

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Figure 6

P:\GIS\Lennar\HuntersPoint\Project\2015Jan_HPAPWP\Fig06_UC-1_UC-2_CERCLA_Conditions.mxd

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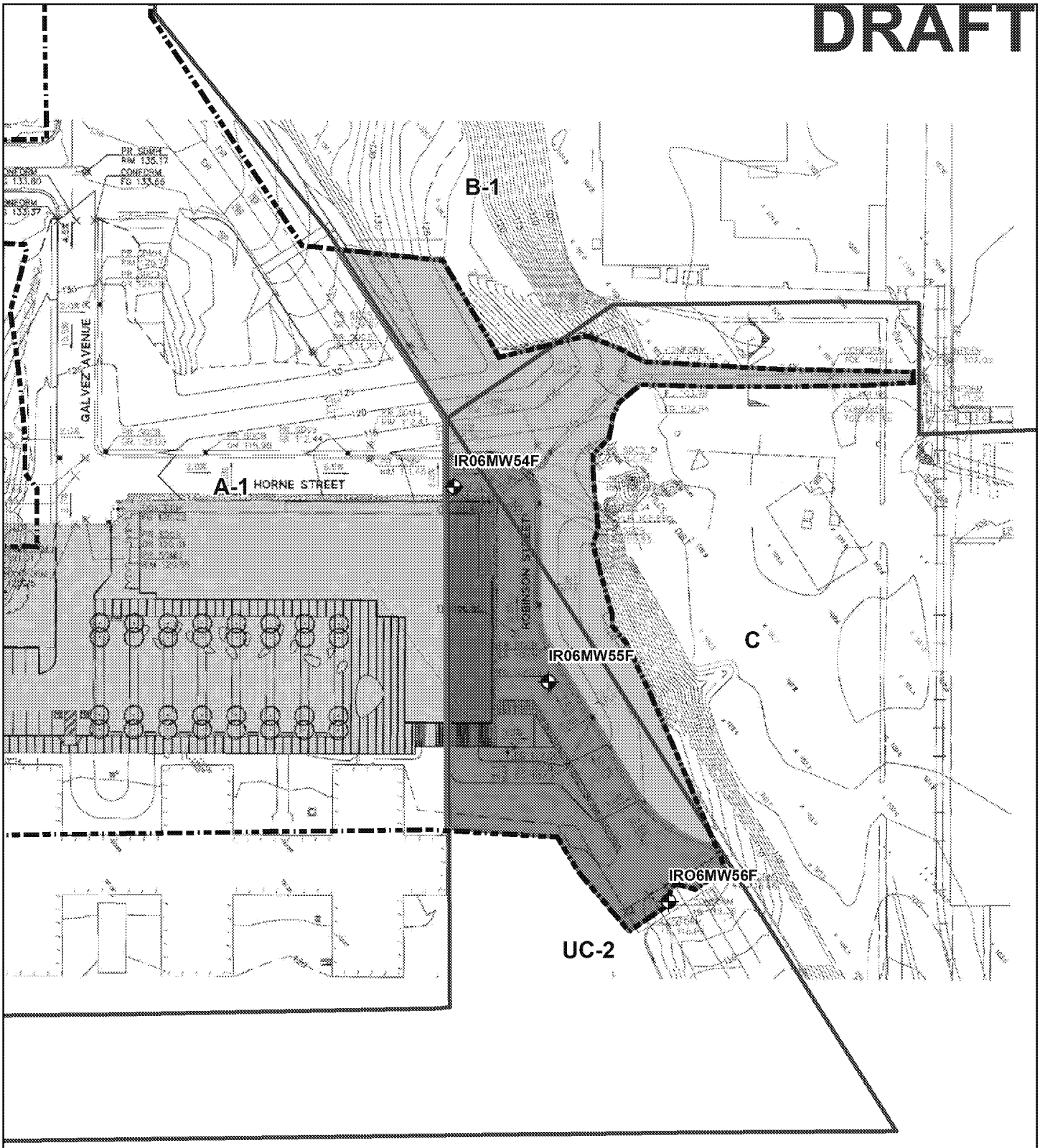

Source: BKF Figure C3.0 Artists Parcel DPW Permit Plans, Grading Plan, 21 April 2014

Legend

- Existing Groundwater Monitoring Well (to be replaced)
- Soil Durable Cover
- Hardscape Durable Cover
- Navy Parcel Boundary
- Limit of Work Within Navy Property
- Impact Area/Limit of Work

0 100 Feet

Durable Cover Plan
Hunters Point Artist Project
San Francisco, CA

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Figure 7

P:\GIS\Lennar\HuntersPoint\Project\2015Jan_HPAPWP\Fig7_DurableCoverPlan.mxd

DRAFT

Parcel A-1

Parcel UC-2

Parcel C

Parcel D-2

Parcel UC-1

Parcel F (Water)

Haul Road

Maintain 15 foot wide driveway to wells

Maintain 15 foot setback from buildings

Stockpile Area

Parcel G

Parcel E

Parcel D-1

HORNE AVE

FISHER AVE

MORRELL ST

COCHRANE ST

HUSSEY ST.

H ST

E ST

I ST

MANSEAU ST

IR09MW61A
IR09MW07A
IR09MW64A
IR09MW54B
IR09MW62A
IR09MW38A
IR09MW31A
IR37MW01A
IR09MW36A
IR09MW44A
IR33MW64A
IR33MW65A
IR33MW66A
IR34MW37A
IR34MW37B
IR34MW02A
PA33MW36A
IR71MW04A
IR71MW04A
IR36MW16A
PA33MW37A
IR71MW12B
IR71MW03A

Legend

Existing Groundwater Monitoring Well

Navy Parcel Boundary

Note:

Wells will be protected in place with adequate access in accordance with the Navy's monitoring program.

N

0 180 Feet

Stockpile Location Map

Hunters Point Artist Project
San Francisco, CA

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Figure 8

P:\GIS\Lennar\HuntersPoint\Project\2015Jan_HPAPWP\Fig08_Stockpile_Loc_Map.mxd

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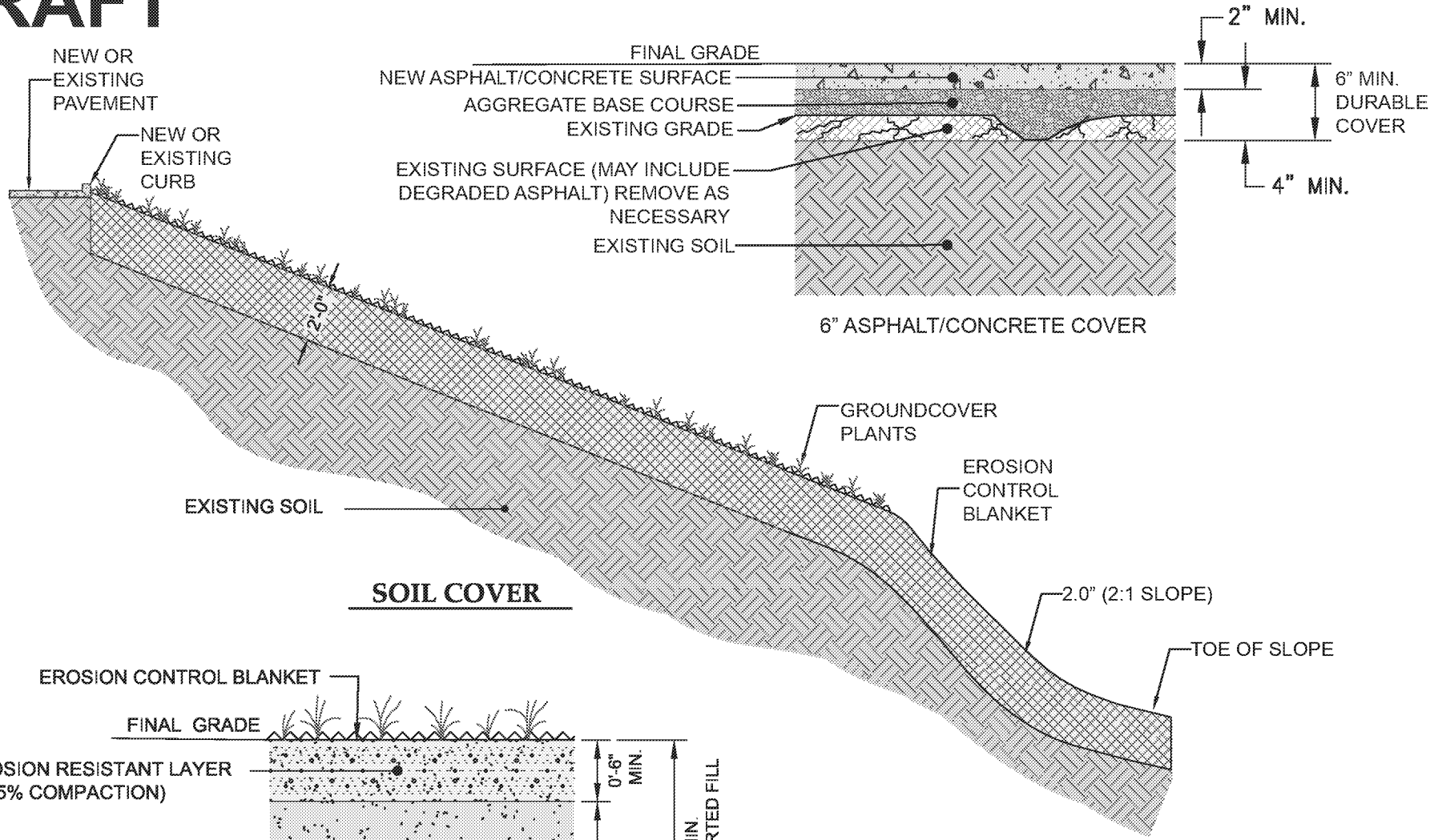
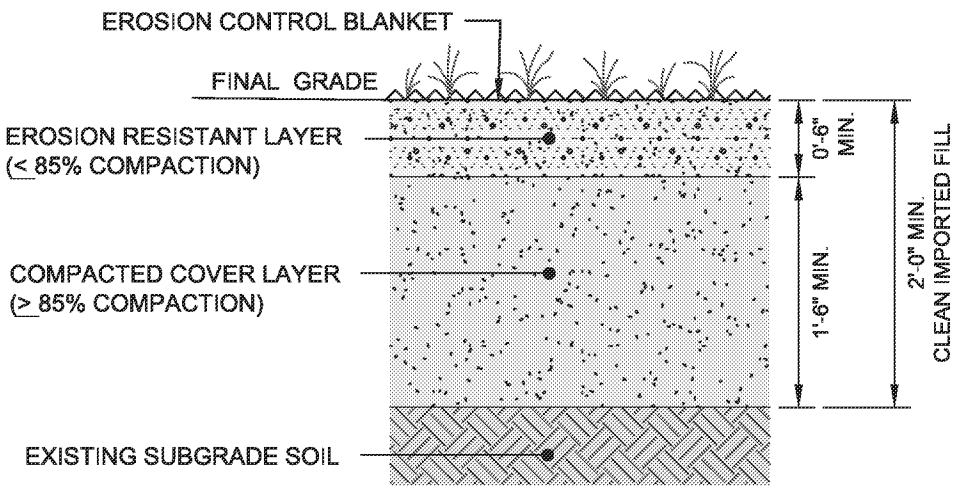


SOIL COVER



SOIL COVER

NOT TO SCALE

Source: ChaduxTt, 2012, Design Basis for Parcels UC-1 and UC-2 Hunters Point Shipyard, SF CA.

Durable Cover Section Details

Hunters Point Artist Project
San Francisco, California

Geosyntec consultants

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Figure 9

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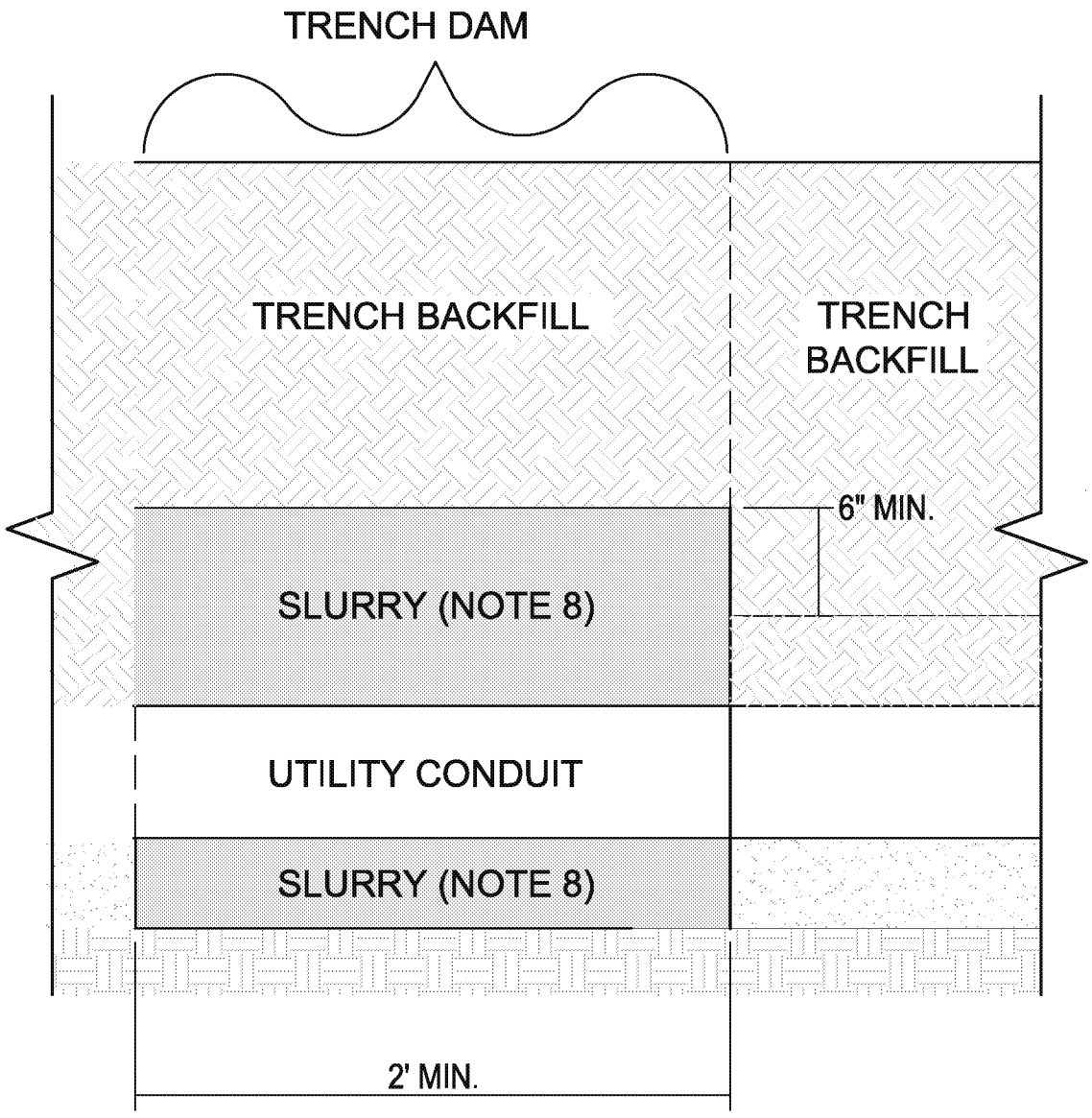

Utility Trench Plug Typical Detail

Hunters Point Artist Project
San Francisco, CA

Geosyntec consultants

Figure 10

WR1247A | April 2015

P:\GIS\Lennar\HuntersPoint\Project\2015Jan_HPAPWP\Fig10_Utility_Trench_Plug_Detail.ai

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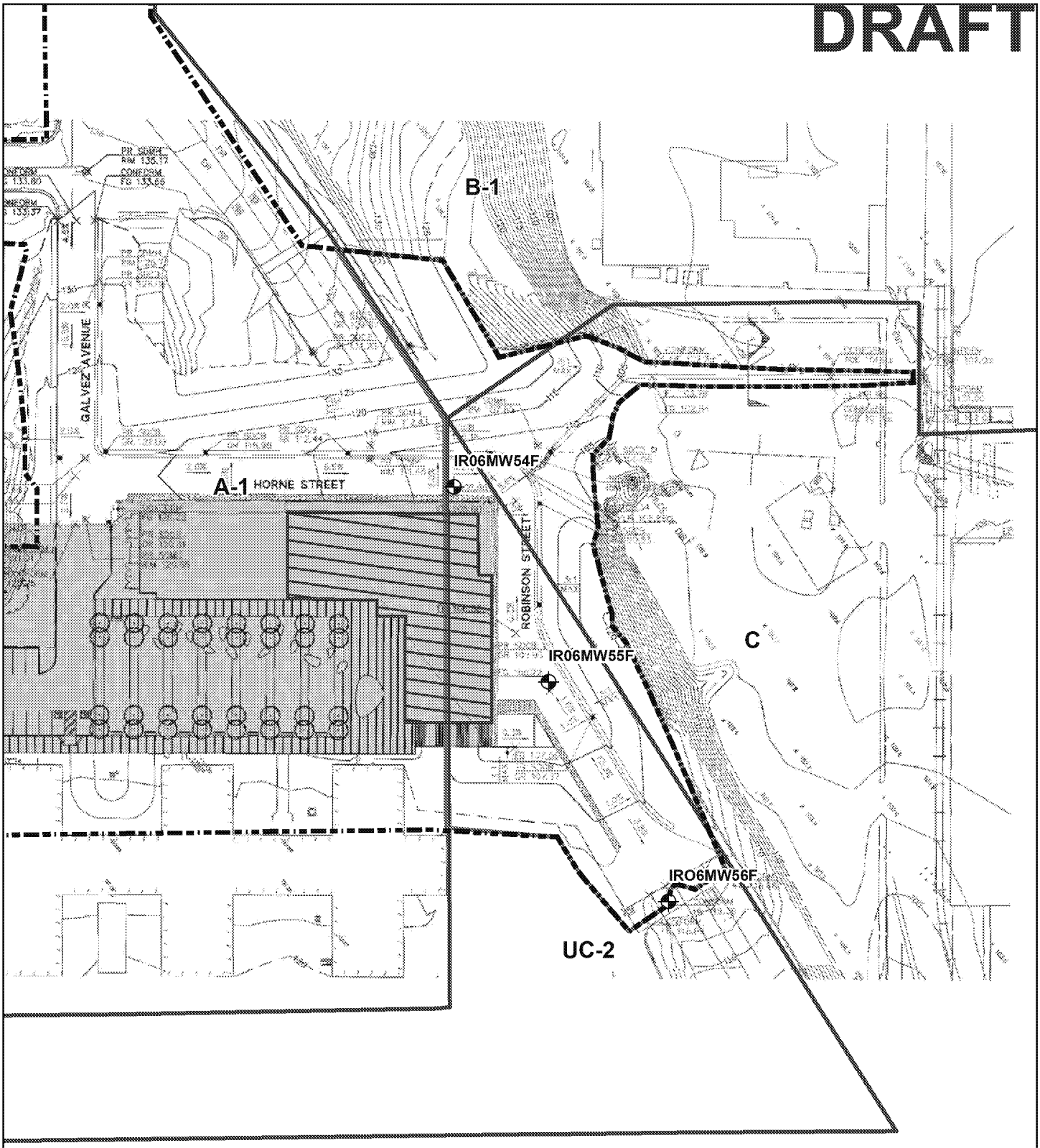

Source: BKF Figure C3.0 Artists Parcel DPW Permit Plans, Grading Plan, 21 April 2014

Legend

- Existing Groundwater Monitoring Well (to be replaced)
- Approximate Area with Passive Sub-Slab Venting System
- Navy Parcel Boundary
- Limit of Work Within Navy Property
- Impact Area/Limit of Work

0 100 Feet

Passive Sub-Slab Venting System Location Map

Hunters Point Artist Project
San Francisco, CA

Geosyntec consultants

WR1247A	April 2015

Figure 11

P:\GIS\Lennar\HuntersPoint\Project\2015Jan_HPAPWP\Fig11_SubSlab_Venting.mxd

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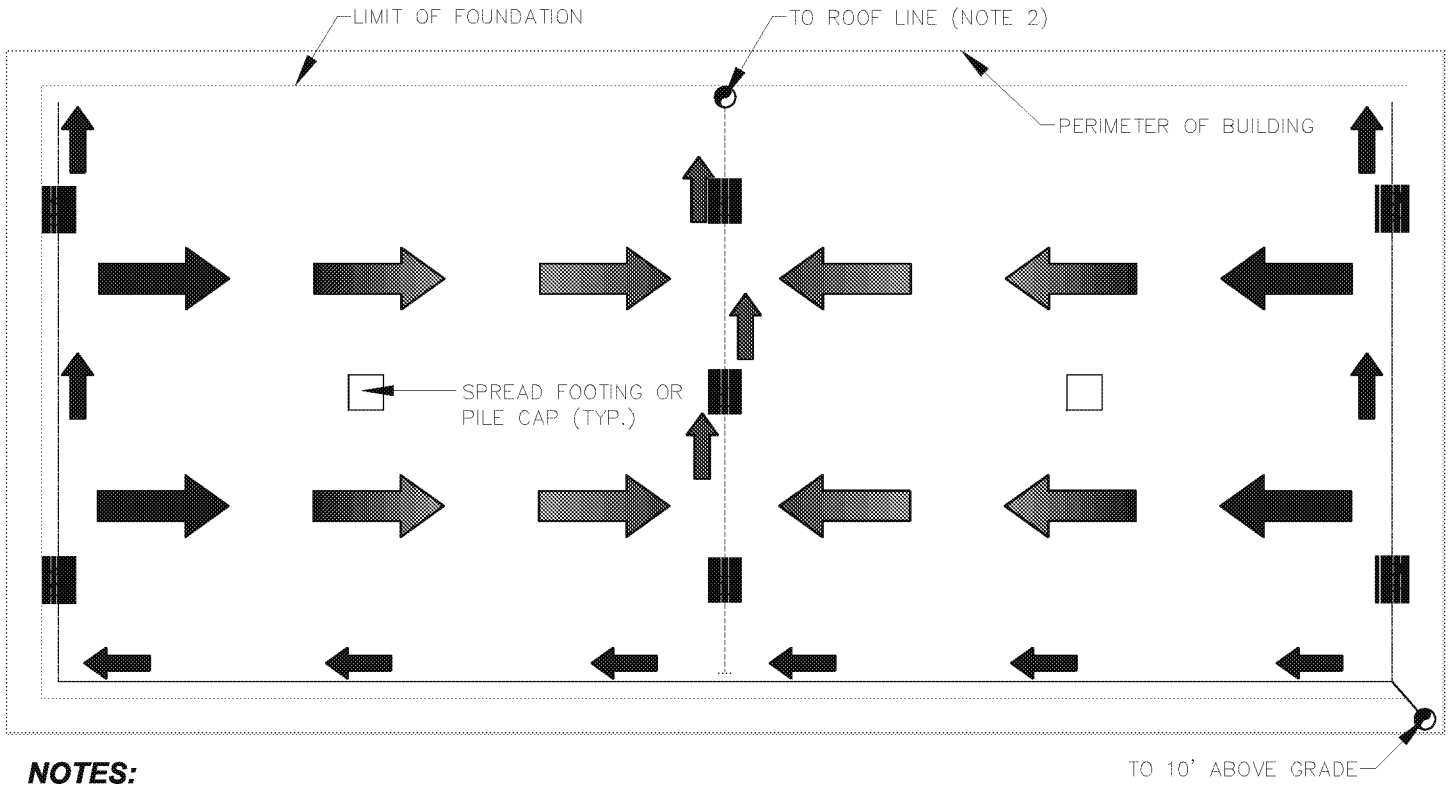

NOTES:

1. BUILDING LAYOUT AND FOUNDATION SYSTEM SHOWN FOR ILLUSTRATION PURPOSES ONLY, NOT BASED ON SPECIFIC PROJECT.
2. VERTICAL RISER PIPE TO BE CONTAINED WITHIN WALL, STAIRWELL, OR OTHER ARCHITECTURALLY ACCEPTABLE LOCATION, AND COMPRISED OF PIPE MATERIAL PER CODE. TOP OF VERTICAL PIPE SHALL BE LOCATED MINIMUM OF 10' FROM ANY HVAC SYSTEM OR BUILDING OPENING AND SHALL HAVE A WIND DRIVEN ROTARY TURBINE VENTILATOR ATTACHED.
3. AIR FLOW SHOWN FOR CONCEPT AND ILLUSTRATION PURPOSES ONLY.

LEGEND

PERFORATED AIR INLET PIPE | PERFORATED VAPOR EXTRACTION PIPE | SOLID WALL AIR INLET HEADER PIPE | AIR FLOW | COLLECTED VAPOR FLOW

Passive Sub-Slab Venting System Schematic – Conceptual Pipe Layout

Hunters Point Artist Project
San Francisco, CA

Geosyntec consultants

Figure 12

WR1247A | April 2015

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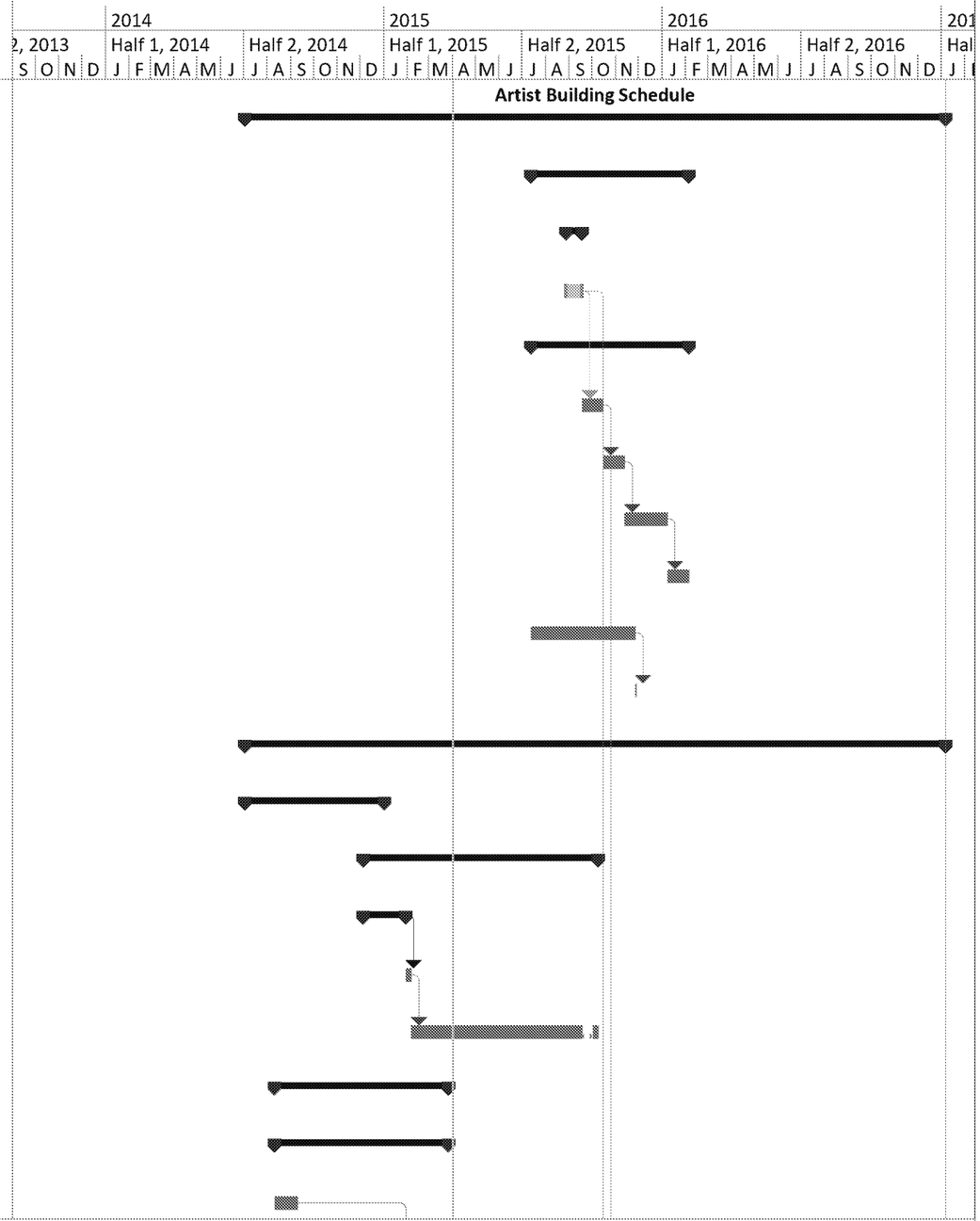
APPENDIX A

Construction Schedule

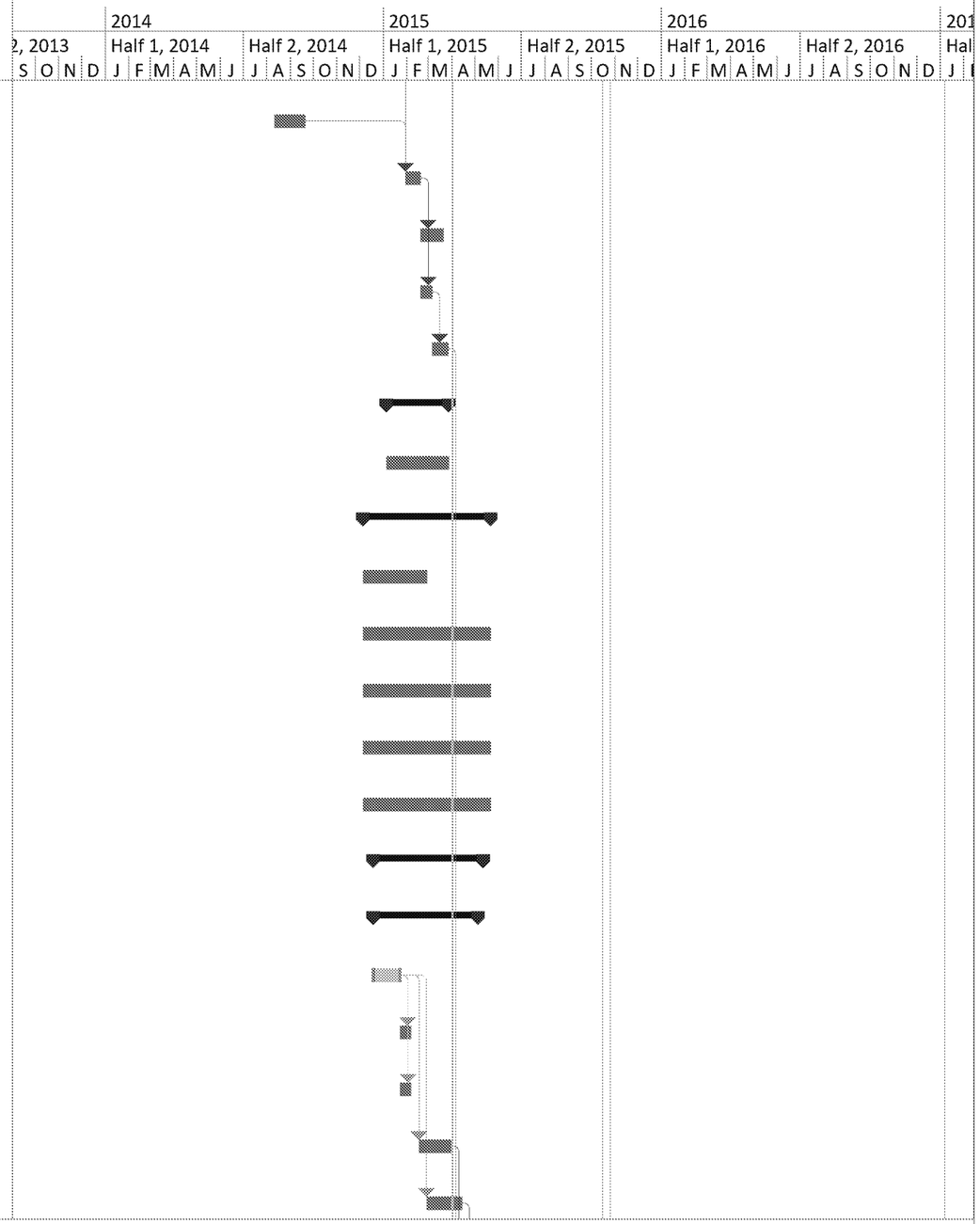
ID	Task Name	Duration	Start	Finish	Predecessors	Notes
1	**Artist Building Schedule**	**657 days**	**Thu 7/3/14**	**Fri 1/6/17**		
2	**Artist Building Infrastructure**	**149 days**	**Mon 7/13/15**	**Thu 2/4/16**		
3	**Demo / Haul Road Improvement**	**15 days**	**Fri 8/28/15**	**Thu 9/17/15**		
4	Demo Bldg 110	3 wks	Fri 8/28/15	Thu 9/17/15		
5	**Artist Building Utility Construction**	**149 days**	**Mon 7/13/15**	**Thu 2/4/16**		
6	Site Grading Work (Parcel B & C Encroachment)	4 wks	Fri 9/18/15	Thu 10/15/15	4	
7	Onsite Utility Construction (Private)	4 wks	Fri 10/16/15	Thu 11/12/15	6	
8	Offsite Utility Construction (Public)	8 wks	Fri 11/13/15	Thu 1/7/16	7	
9	Roadway Paving	4 wks	Fri 1/8/16	Thu 2/4/16	8	
10	Galves/Robinson Street Entrance Closed	19.8 wks	Mon 7/13/15	Thu 11/26/15		
11	Submit Closure Docs to Navy	1 day	Fri 11/27/15	Fri 11/27/15	10	
12	**Artist Building Construction**	**657 days**	**Thu 7/3/14**	**Fri 1/6/17**		
13	**Architecture - DD**	**131 days**	**Thu 7/3/14**	**Thu 1/1/15**		
17	**Storm Water Control Plan**	**220 days**	**Fri 12/5/14**	**Thu 10/8/15**		
18	Prepare Storm Water Control Plan	2 mons	Fri 12/5/14	Thu 1/29/15	14	
19	Storm Water Control Plan Meeting	5 days	Fri 1/30/15	Thu 2/5/15	14SS+50%,18	
20	Storm Water Control Plan - PreApp Submittal	165 days	Fri 2/6/15	Thu 10/8/15	19,14	
21	**Site Permit Process**	**164 days**	**Mon 8/11/14**	**Thu 3/26/15**		
22	**Architecture**	**164 days**	**Mon 8/11/14**	**Thu 3/26/15**		
23	Site Permit Review - DBI	30 edays	Mon 8/11/14	Wed 9/10/14		



Project: Artist Replacement Space
Date: Thu 4/2/15

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	Manual Progress
Summary	Inactive Task	Duration-only	Finish-only	

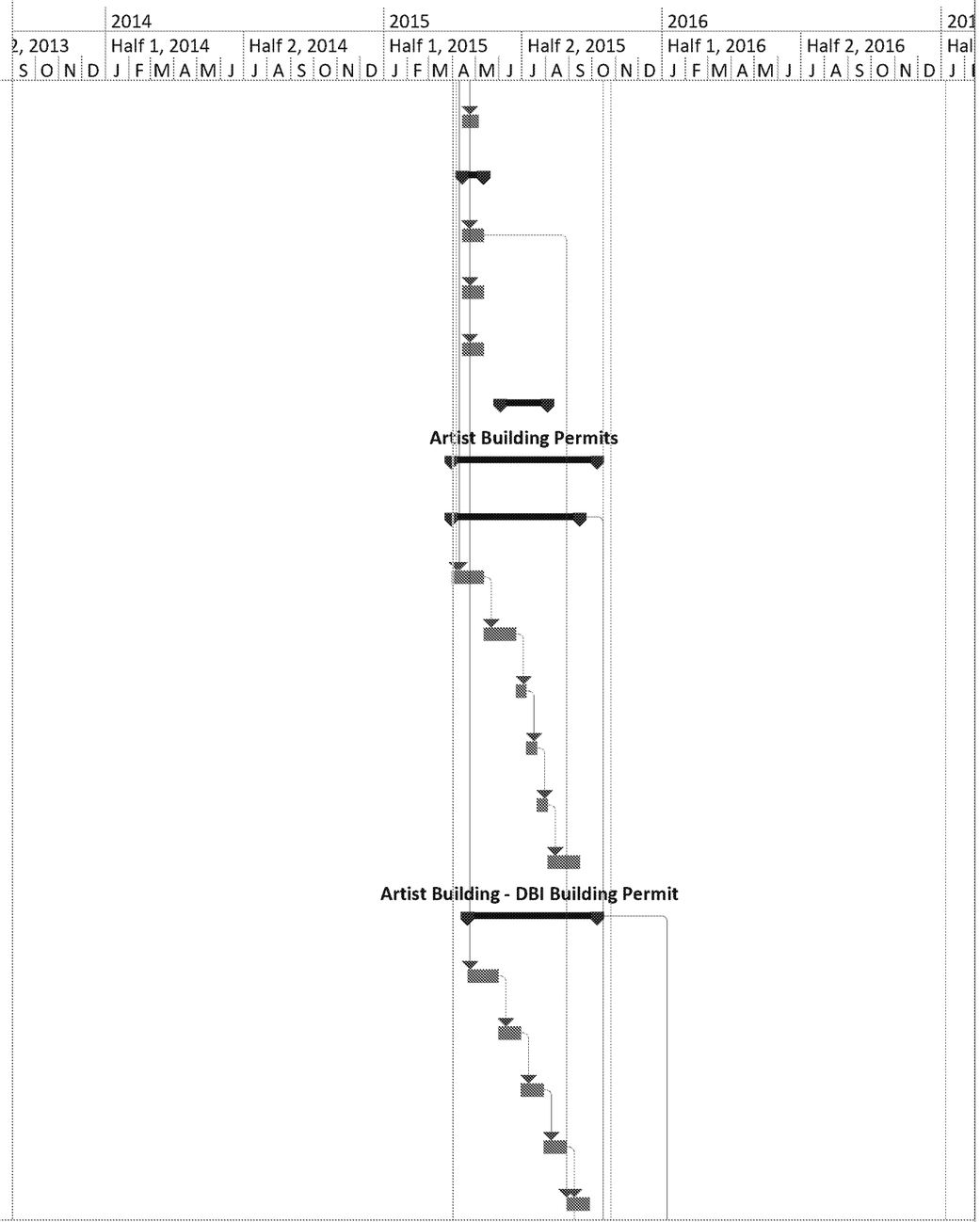
ID	Task Name	Duration	Start	Finish	Predecessors	Notes
24	Site Permit Review - Fire	40 edays	Mon 8/11/14	Sat 9/20/14		
25	Site Permit Review - DPW	20 edays	Thu 1/29/15	Wed 2/18/15	23,24	
26	Site Permit Review - PUC	30 edays	Wed 2/18/15	Fri 3/20/15	25	
27	Site Permit Review - OCII	15 edays	Wed 2/18/15	Thu 3/5/15	25	
28	Site Permit Approval	15 days	Fri 3/6/15	Thu 3/26/15	27	
29	**Design Build Tasks**	**60 days**	**Mon 1/5/15**	**Fri 3/27/15**		
30	PV Panels (Design)	60 days	Mon 1/5/15	Fri 3/27/15	14	
31	**Utility Applications**	**120 days**	**Fri 12/5/14**	**Thu 5/21/15**		
32	Temp Power	3 mons	Fri 12/5/14	Thu 2/26/15	14	
33	Permanent Power	6 mons	Fri 12/5/14	Thu 5/21/15	14	
34	Gas	6 mons	Fri 12/5/14	Thu 5/21/15	14	
35	Water-Domestic, Fire, Reclaimed	6 mons	Fri 12/5/14	Thu 5/21/15	14	
36	Sewer	6 mons	Fri 12/5/14	Thu 5/21/15	14	
37	**Construction Document Phase**	**102 days**	**Fri 12/19/14**	**Mon 5/11/15**		
38	**Artist Building Architecture**	**97 days**	**Fri 12/19/14**	**Mon 5/4/15**		
39	Construction Documents (50% CD's)	1.25 mons	Fri 12/19/14	Thu 1/22/15		
40	Pricing/VE (50% CD's) + GC + CM	2 wks	Fri 1/23/15	Thu 2/5/15	39	
41	QA / QC	2 wks	Fri 1/23/15	Thu 2/5/15	39	
42	Foundation Permit Documents	30 days	Tue 2/17/15	Mon 3/30/15	39	
43	Construction Documents (100% CD's)	1.6 mons	Fri 2/27/15	Mon 4/13/15	39	



Project: Artist Replacement Space
Date: Thu 4/2/15

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline			
Split	External Tasks	Inactive Summary	Manual Summary	Progress			
Milestone	External Milestone	Manual Task	Start-only	Manual Progress			
Summary	Inactive Task	Duration-only	Finish-only				

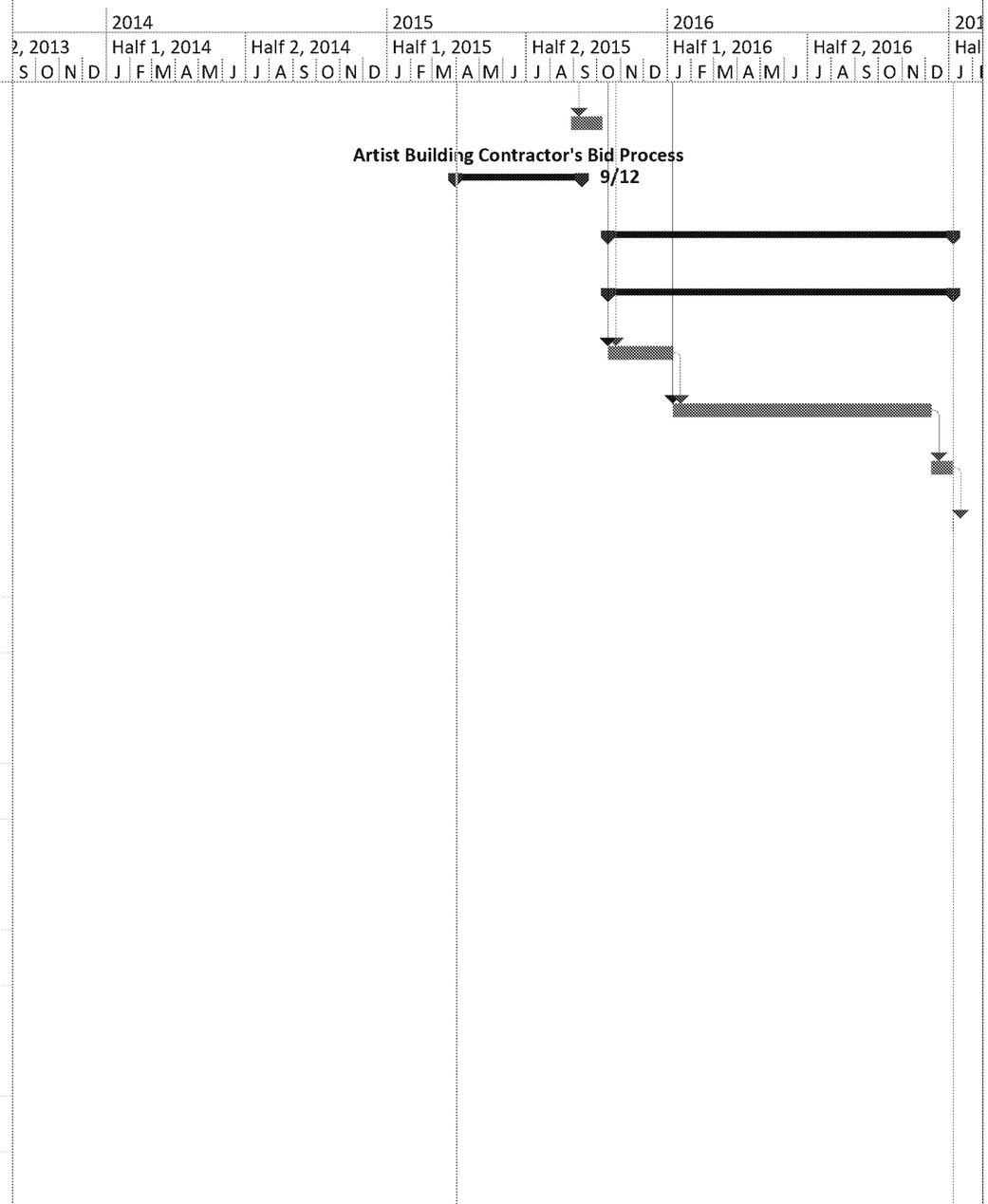
ID	Task Name	Duration	Start	Finish	Predecessors	Notes
44	QA / QC	3 wks	Tue 4/14/15	Mon 5/4/15	43	
45	**Artist Building SWCP / SWPPP / Erosion Control**	**20 days**	**Tue 4/14/15**	**Mon 5/11/15**		
46	Storm Water Control Plan - Final Submittal / Approvals	1 mon	Tue 4/14/15	Mon 5/11/15	43	
47	Erosion Control Plan - Engeo	4 wks	Tue 4/14/15	Mon 5/11/15	43	
48	Storm Water Pollution Prevention Plan - Engeo	4 wks	Tue 4/14/15	Mon 5/11/15	43	
49	**Finance / Legal**	**44 days**	**Wed 6/3/15**	**Mon 8/3/15**		
56	**Artist Building Permits**	**137 days**	**Tue 3/31/15**	**Wed 10/7/15**		
57	**Artist Building - Foundation / Superstructure Permit**	**120 days**	**Tue 3/31/15**	**Mon 9/14/15**		
58	Archchitectual Review / Approval	30 days	Tue 3/31/15	Mon 5/11/15	42,28	
59	Structural Review / Approval	30 days	Tue 5/12/15	Mon 6/22/15	58	
60	DPW Review / Approval	2 wks	Tue 6/23/15	Mon 7/6/15	59	
61	PUC Review / Approval	2 wks	Tue 7/7/15	Mon 7/20/15	60	
62	DPH Review / Approval	2 wks	Tue 7/21/15	Mon 8/3/15	61	
63	OCII Review / Approval	30 days	Tue 8/4/15	Mon 9/14/15	62	
64	**Artist Building - DBI Building Permit**	**122 days**	**Mon 4/20/15**	**Wed 10/7/15**		
65	Architectural Review / Approval	40 edays	Mon 4/20/15	Sat 5/30/15	43FS+1 wk	
66	Structural Review / Approval	30 edays	Sat 5/30/15	Mon 6/29/15	65	
67	MEP Review / Approval	30 edays	Mon 6/29/15	Wed 7/29/15	66	
68	DPW Review / Approval	30 edays	Wed 7/29/15	Fri 8/28/15	67	
69	PUC Review / Approval	30 edays	Fri 8/28/15	Sun 9/27/15	68,46	



Project: Artist Replacement Space
Date: Thu 4/2/15

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline			
Split	External Tasks	Inactive Summary	Manual Summary	Progress			
Milestone	External Milestone	Manual Task	Start-only	Manual Progress			
Summary	Inactive Task	Duration-only	Finish-only				

ID	Task Name	Duration	Start	Finish	Predecessors	Notes
70	OCII Review / Approval	40 edays	Fri 8/28/15	Wed 10/7/15	68	
71	**Artist Building Contractor's Bid Process**	**119 days**	**Tue 3/31/15**	**Sat 9/12/15**		
81	**Construction Phase**	**321 days**	**Fri 10/16/15**	**Fri 1/6/17**		
82	**Artist Building Construction**	**321 days**	**Fri 10/16/15**	**Fri 1/6/17**		
83	Artist Building Foundation Start	3 mons	Fri 10/16/15	Thu 1/7/16	57,80,4,6	
84	Artist Building Construction / incl. podium	12 mons	Fri 1/8/16	Thu 12/8/16	64,83	
85	Artist Building Sign Off	4 wks	Fri 12/9/16	Thu 1/5/17	84	
86	TCO	1 day	Fri 1/6/17	Fri 1/6/17	85	



Project: Artist Replacement Space Date: Thu 4/2/15	Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
	Split	External Tasks	Inactive Summary	Manual Summary	Progress
	Milestone	External Milestone	Manual Task	Start-only	Manual Progress
	Summary	Inactive Task	Duration-only	Finish-only	

APPENDIX B
Environmental Health and Safety Plan Outline

Geosyntec consultants

APPENDIX B
Environmental Health and Safety Plan Outline

All EHSPs will include a description of specific tasks to be performed, key personnel, health and safety responsibilities, site background, job hazard analysis and mitigation, air monitoring procedures, PPE, work zones and site security measures, decontamination measures, general safe work practices, contingency plans and emergency information, medical surveillance and specific training requirements. An example outline of an EHSP is presented below:

SITE EMERGENCY INFORMATION

1.0 INTRODUCTION

- 1.1 Purpose of the Site Health and Safety Plan
- 1.2 Implementation and Modification of the Site Safety Plan
- 1.3 Project-Related Documents

2.0 BACKGROUND AND DESCRIPTION OF WORK

- 2.1 Site Description and Background
- 2.2 Scope of Work

3.0 KEY PERSONNEL ROLES AND RESPONSIBILITIES

- 3.1 Project and Task Managers
- 3.2 Field Supervisor
- 3.3 Site Health and Safety Officer
- 3.4 Competent Person
- 3.5 Subcontractors, Visitors and Other Onsite Personnel

4.0 JOB HAZARD ANALYSIS

5.0 GENERAL SITE SAFE WORK PRACTICES

- 5.1 Biological Hazards
- 5.2 Radiological Hazards
- 5.3 Dust Control
- 5.4 Electrical
- 5.5 Excavation/Trenching
- 5.6 Fire/Explosion Control
- 5.7 Hand and Power Tools
- 5.8 Heat Stress
- 5.9 Heavy Equipment
- 5.10 Lifting
- 5.11 Material Handling
- 5.12 Noise
- 5.13 Overhead / Falling Debris
- 5.14 Slips/Trips/Falls
- 5.15 Utilities: Underground and Overhead
- 5.16 Vehicle Traffic

6.0 CHEMICAL HAZARDS

- 6.1 Chemicals of Concern
- 6.2 Action Levels

7.0 PERSONAL PROTECTIVE EQUIPMENT

8.0 AIR MONITORING PROCEDURES

- 8.1 Ambient Air Monitoring
- 8.2 Worker Exposure Monitoring

9.0 TRAINING AND MEDICAL MONITORING

10.0 CONTINGENCY AND EMERGENCY EVACUATION PLANS

APPENDIX C

Dust Control Plan/
Asbestos Dust Mitigation Plan

Prepared for

CP Development Co., LP
1 Sansome Street, Suite 3200
San Francisco, California 94104

DRAFT ASBESTOS DUST MITIGATION AND FUGITIVE DUST CONTROL PLAN

HUNTERS POINT ARTISTS' PARCELS
PARCELS A, B-1, C, and UC-2

HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

Prepared by

Geosyntec consultants

engineers | scientists | innovators

1111 Broadway, 6th Floor
Oakland, California 94607

Project Number: WR1247A

15 April 2015

DRAFT Asbestos Dust Mitigation and Fugitive Dust Control Plan

Hunters Point Artists' Parcels
Parcels A, B-1, C, and UC-2

Hunters Point Shipyard
San Francisco, California

Prepared by

Geosyntec Consultants, Inc.
1111 Broadway, 6th Floor
Oakland, California 94607

DRAFT

Randolph C. Brandt, P.G.
Principal

Project Number: WR1247A
15 April 2015

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

ADM/DCP	Asbestos Dust Mitigation and Fugitive Dust Control Plan
ATCM	Airborne Toxic Control Measure
BAAQMD	Bay Area Air Quality Management District
BMP	best management practices
CCR	California Code of Regulations
CCSF	City and County of San Francisco
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CP	Candlestick Point
DTSC	Department of Toxic Substance Control
HEPA	high-efficiency particulate air
HPS	Hunters Point Project Area
km/h	kilometers per hour
mph	miles per hour
SFDPH	San Francisco Department of Public Health
SWPPP	Storm Water Pollution Prevention Plan
TSP	Total Suspended Particulate
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

This combined Asbestos Dust Mitigation and Fugitive Dust Control Plan (ADM/DCP) has been prepared and submitted by Geosyntec Consultants, Inc. (Geosyntec) under contract to and on behalf of CP Development Co., LP (CP DevCo) as part of the planning process for proposed site development activities to occur at the Hunters Point Artists' Parcels project area (HPAP). The HPAP will be located within a portion of Hunters Point Shipyard (HPS) Parcels A, B-1, C, and UC-2 (the Site) in San Francisco, California. Parcels A, B-1, C, and UC-2 are located along the northern and eastern portion of the former HPS. Parcel A adjoins the Hilltop portion of Parcel A' and contains existing Buildings 101, 110 and 808 and the land immediately surrounding these buildings. Parcels B-1, C, and UC-2 are located to the north and east of Parcel A. While the majority of the HPAP work will occur within Parcel A, improvements will be constructed within small portions of Parcels B-1, C, and UC-2. A Site Location Map and a Site Plan are depicted in Figures 1 and 2, respectively.

The boundaries of the Project Site are shown in Figure 2. Project information is as follows:

Company Name and Address	Project Location/Schedule
CP Development Co., LP 1 Sansome Street, Suite 3200 San Francisco, California 94104 Attention: Jeffrey C. Martin Phone: 415-344-8841	The project location is bordered by open space areas of Parcel A' to the west and southwest, by streets on the northwest and north and by Navy property on the north, east and south. Existing and future residential neighborhoods are present further to the west beyond the open space areas of Parcel A' (Figure 2).
	San Francisco, California
	Start Date: August 2015
	Estimated Completion Date of Project: December 2016
	Job Trailer Location: The CP DevCo job trailer is located along Galvez Avenue and to the south of Donahue. This location may change as new work commences.

2. REGULATORY FRAMEWORK

The Hunters Point Shipyard Reuse Final Environmental Impact Report 2000 (FEIR 2000) includes mitigation measures requiring actions that will reduce or eliminate adverse environmental impacts during development of Parcels A' and A. These mitigation measures were adopted in a Mitigation Monitoring and Reporting Program, dated 19 January 2000. The Disposition and Development Agreement incorporates FEIR 2000 mitigation measures that are relevant for Phase I development on Parcels A' and A and includes the commitments for implementing mitigation measures set forth in Section 20 of the Disposition and Development Agreement and in the EIR Addendum, dated 19 November 2003.

In the summer of 2010, the City and County of San Francisco (CCSF) certified the Candlestick Point-Hunters Point Shipyard Phase II Project Final Environmental Impact Report 2010 (CP-HPS Phase II FEIR 2010), which includes mitigation measures to be implemented during development of some portions of Parcels A' and A on the southern edge of the Hilltop parcel and to be implemented at Parcels B-1, C, and UC-2. These mitigation measures were adopted in the Mitigation Monitoring and Reporting Program, dated July 2010.

The applicable mitigation measures for dust control from FEIR 2000 and CP-HPS Phase II FEIR 2010 and the requirement to comply with them were incorporated into the amendments to the San Francisco Health Code Article 31 and corresponding Implementing Regulations that were adopted by the San Francisco Board of Supervisors in the summer of 2010. Submittal of this ADM/DCP and approval by the San Francisco Department of Public Health (SFDPH) is intended to meet the applicable requirements of the Mitigation Measures, Article 31, and the Implementing Regulations.

This ADM/DCP specifically identifies the Best Management Practices (BMPs) that will be implemented to reduce air particulate emissions resulting from soil disturbance or excavation associated with grading, utility work, construction of site infrastructure, and foundation construction. This plan also includes monitoring and reporting requirements.

This ADM/DCP has been prepared in response to SFDPH Article 31 requirements and pursuant to Title 17 of the California Code of Regulations (17 CCR) Section 93105, Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading,

Quarrying and Surface Mining Operations, and the City and County of San Francisco Municipal Health Code Article 31, Construction Dust Control Requirements.

This DCP incorporates requirements of the following applicable codes and regulations.

- California Code of Regulations (CCR) Title 17, Section 93105, the Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations;
- Bay Area Air Quality Management District (BAAQMD) Regulation 2, Permits;
- BAAQMD Regulation 6, Particulate Matter and Visible Emissions;
- City and County of San Francisco Building Code Section 106A.3.2.6, Construction Dust Control;
- City and County of San Francisco Health Code Article 22B;
- City and County of San Francisco Health Code Article 31 and Implementing Regulations;
- City and County of San Francisco Order Number 171,378;
- FEIR 2000 Mitigation Measure 2.B: Construction PM10;
- FEIR 2000 Mitigation Measure 8.A: Handling Naturally Occurring Asbestos during Construction; and
- CP-HPS Phase II FEIR 2010 Mitigation Measure MM HZ-15: Asbestos Dust Mitigation Plans and Dust Control Plans.

Collectively, these regulations and Mitigation Measures specify a goal of "no visible dust" emissions from the Site and outline BMPs required to meet this goal.

Because the Site is within an area that could contain naturally occurring asbestos in the soil and serpentine rock, CCR Title 17, Section 93105 (ATCM) apply to ground disturbing activities at the Site. ATCM includes, among other things, the requirement for submission of an Asbestos Dust Mitigation Plan for BAAQMD approval prior to grading activities. The ATCM also includes specific practices to be implemented during construction. Mitigation Measure 8.A also provides BMPs for handling serpentine material.

Contractors selected to perform construction will be responsible for obtaining applicable permits and complying with permit conditions as described in the project specifications.

Neither CP DevCo nor any of its contractors, subcontractors, representatives, or agents, shall engage in any construction or grading activity anywhere on the Site, or in conjunction with a Work Site related offsite utility or trenching project, unless the provisions of this ADM/DCP, including without limitation the mitigation measures presented in Section 7.0 and the air monitoring measures presented in Section 8.0, are implemented at the beginning and maintained throughout the duration of the construction or grading activity.

2.1 ATCM

The asbestos ATCM (17 CCR 93105(b)(1)) states that the ADM/DCP, and the dust mitigation measures contained therein, apply to "any construction, grading...operation on any property [where] ... [a]ny portion of the area to be disturbed is located in a geographic ultramafic rock unit." The terms "Construction," "Grading," "Construction or Grading Operation" and "Construction or Grading Activity" are defined in the ATCM to mean "any surface disturbance conducted with powered equipment or any related activity, including, but not limited to, all surface and subsurface cuts and fills, excavation, trenching, stockpiling, bulldozing, and landfills". (California Code of Regulations, Title 17, § 93105, Subdivision (i)(12).).

Regulatory authority for compliance with the ATCM is with the Bay Area Air Quality Management District (BAAQMD). Non-compliance with any provision of this ADM/DCP shall not subject any person or entity to BAAQMD jurisdiction or otherwise implicate BAAQMD enforcement authority except to the extent that such provision is required to be included in this ADM/DCP pursuant to the ATCM without regard to Article 31. All mitigation measures listed in Section 7 and all monitoring requirements listed in Section 8.1 are required to be included in this ADM/DCP pursuant to the ATCM without regard to Article 31. This ADM/DCP was submitted to BAAQMD in April 2015 and was subsequently approved by the BAAQMD on _____, 2015 (Appendix A).

2.2 Article 31

San Francisco Health Code Article 31, Construction Dust Control Requirements, is intended to protect residents of San Francisco from exposure to construction dust generated by construction activities on Parcels A and A' by requiring Dust Control Plans with monitoring and control measures. Article 31 applies to all construction projects in Parcels A and A' that disturb 50 cubic yards, or more, of soil. As described above, work will occur within Parcels B-1, C and UC-2. Currently, these parcels are owned by the United States Navy and, therefore, Article 31 does not yet officially apply. Despite this, it is the intention of this ADM/DCP and CP DevCo to comply with all applicable provisions of Article 31 for all work occurring at the Site, regardless of ownership.

Regulatory authority for compliance with Article 31 is with the San Francisco Department of Public Health (SFDPH). Non-compliance with any provision of this ADM/DCP shall not subject any person or entity to SFDPH jurisdiction or otherwise implicate SFDPH enforcement authority except to the extent that such provision is required to be included in this ADM/DCP pursuant to Article 31 without regard to the ATCM. This ADM/DCP was submitted to the SFDPH in April of 2015 and was subsequently approved by SFDPH on _____, 2015 (Appendix A).

2.3 No Visible Dust Goal

The dust control measures set forth in this plan are intended to achieve a goal of no visible dust emissions associated with soil disturbance, movement, or excavation of soil, to the extent required by the applicable regulations identified above.

3. PROJECT DESCRIPTION

This Section presents background information on the Site, a description of the of the development activities to occur over the lifetime of the project and a description of the local topography and geology. For purposes of clarity, the following terms and related definitions are used throughout the ADM/DCP:

- Parcel A' – This term comprises both the Hilltop and Hillside sub-parcels. It is 75 acres in total area.
- Parcel A – This term comprises both non-contiguous parts of Parcel A. It is 9.4 acres in total area.
- Project Area – An interchangeable term used alongside Site or HPAP.
- Hilltop Parcel – 56 acre parcel currently undergoing vertical development. Includes existing buildings 101, 110 and 808.
- Hillside Parcel – 19 acre parcel currently idle and awaiting development (completion of all infrastructure components and vertical development).
- Parcel B-1 – 27 acre parcel currently owned by the Navy. Parcel B-1 is estimated to transfer to CCSF in late 2015.
- Parcel C – 73 acre parcel currently owned by the Navy. Parcel C is estimated to transfer to CCSF in late 2017.
- Parcel UC-2 – 3.8 acre parcel currently owned by the Navy. Parcel UC-2 is estimated to transfer to CCSF in mid-2015.
- Development Parcel– The HPAP area has been divided into development parcels (e.g., the Commercial Kitchen parcel or the Artist Building parcel))
- Construction Site – Any area of the Site that is undergoing active construction. This term also includes support/staging areas immediately adjacent to the active construction.
- Future Street – Any street within the Site that is either already in place or will be installed via future construction efforts
- Building 101, 110 and 808 – Remaining buildings in Parcel A. Buildings 101 and 110 are occupied by artists or local businesses. Building 808 is currently vacant. Building 110 will be demolished during the HPAP development project.

3.1 Development Description

The proposed project to be executed at the Site by CP DevCo is part of an integrated, mixed-use development program planned for the larger Hunters Point and Candlestick Point (CP) project area. Together, the HPS and CP Site encompasses approximately 780 acres and work includes demolition of existing structures within the project area, mass grading to meet design grades and facilitate surface water drainage, installation of new below grade utilities, construction of new roads, reconstruction of existing roads, construction of public open spaces and construction of new housing and commercial buildings. It is estimated that the total duration of all development activities across both HPS and CP could exceed 15 years.

The HPAP project consists of constructing replacement workspace for the commercial kitchen currently located in Building 110 and constructing additional space for artists currently located on Parcel B-1. Building 110 will be demolished once the commercial kitchen is complete and in its place the new artist building will be constructed. The new artist building will be utilized by artists currently located in buildings on Parcel B-1; buildings occupied by artists on Parcel B-1 will be demolished once the property is transferred to CCSF and the new building is completed.

Prior to and during construction of the two buildings at the Site, mass grading will occur to achieve design grades followed by installation of below grade utilities and completed with surface features (streets, sidewalks, parking areas, public open space plaza and stormwater management devices).

3.2 Regional Topography and Site Setting

Parcels A' and A, as set forth in the Quitclaim Deeds for the Hilltop Parcel and the Hillside Parcel of the Hunters Point Shipyard, both recorded on 3 December 2004, together consist of approximately 75 acres and both are located in the northern portion of the HPS. The Hilltop Parcel (56 acres) is located on a topographic high relative to the surrounding portions of the former Hunters Point Shipyard. To the east of the Hilltop Parcel is Parcel B-1; to the southeast are Parcels UC-2 and C; to the south are Parcels D-1 and G, and to the west are Parcels E and E-2. Existing residential neighborhoods border the Hilltop Parcel on the north.

Historically, the dominant land use of Parcels A' and A was residential and non-industrial. The Navy-owned residential structures on Parcel A' were demolished prior to

Site grading and backbone infrastructure construction. During the mass grading phase of the project, vertically-oriented concrete block keystone retaining walls were installed, and newly graded slopes on both the Hilltop and Hillside parcels were seeded to achieve a vegetative cover. During the utility installation phase of the project, concrete road base and curb and gutter were installed across all areas of the Hilltop parcel. The portion of the Hilltop parcel bordering Donahue Street also included sidewalk installation. At the Hillside parcel utility installation is partially complete. At the conclusion of utility installations, the entire Site was stabilized by a combination of hardscape (i.e., paved roads, retaining walls, curb, gutter and portions of sidewalk) and a vegetative cover.

Parcel A has remained unchanged since its transfer from the Navy in 2004 and the two buildings on the Site, 101 and 110, were historically used as administrative offices. Areas surrounding buildings 101 and 110 are stabilized by asphalt streets and parking and vegetative cover.

The majority of Parcel B-1 was used for administrative purposes with some areas containing operational uses (e.g., the submarine "pens" and adjacent land) subject to light industrial activity. The portion of Parcel B-1 that will be disturbed in support of the HPAP project is currently open space that has been covered in accordance with the Navy's CERCLA remediation work over the past several years.

Parcel C was the industrial core of HPS and contains a number of large buildings. Currently, all buildings within Parcel C are not occupied, and the Navy continues with their CERCLA remediation work. The portion of Parcel C that will be disturbed in support of the HPAP project is currently open space.

Parcel UC-2 contains an asphalt-paved parking lot east of Building 101 and portions of Robinson and Fisher Streets (existing streets within HPS). The HPAP project will disturb the portion of Parcel UC-2 that overlies Robinson Street.

Figure 3 presents the Site location relative to sensitive receptors within 1000 feet of the Site.

3.3 Site History

The United States Department of the Navy (Navy) acquired the title to the land known as HPS in 1940 and began developing its shipyard activities, including shipbuilding,

repair, and maintenance. Buildings at HPS included office and commercial buildings such as facilities for warehousing, fuel storage and distribution, and machining and metal fabrication. Between 1976 (the point at which the Navy ceased its operations) and 1986, the Navy leased most of HPS to a private ship-repair company, which conducted activities similar to the Navy's.

HPS has been divided into thirteen parcels (Parcels A, B-1, B-2, C, D-1, D-2, E, E-2, F, G, UC-1, UC-2, and UC-3) for purposes of remediation. Multiple investigations have been performed at HPS for over 20 years. Between 1984 and 1993, initial preliminary assessments were conducted facility-wide at HPS. Based on the results of these initial preliminary assessments, subsequent preliminary assessments were performed within Parcel A, B-1, C, and UC-2 to further evaluate possible sites for inclusion in the remedial investigation program.

Beginning in the mid-1990's, the Navy performed remedial investigations of Parcels A, B-1, C, and UC-2 to characterize the nature and extent of chemical contamination in the parcels. The United States Environmental Protection Agency (USEPA), the Department of Toxic Substance Control (DTSC), and Regional Water Quality Control Board (RWQCB) participated and were consulted throughout the remedial investigation process and the development of the Record of Decision (ROD) documents for each of the parcels. The RODs approved by the USEPA and co-regulatory agencies are the decision documents demonstrating that the Navy has taken all necessary remedial actions to comply with Section 120(h)(3) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

The ROD for Parcels A' and A was finalized in 1995; the RODs for Parcels B (which includes Parcel B-1), C, and UC-2 were finalized in 2009, 2010 and 2009, respectively.

A final Finding of Suitability to Transfer (FOST) Parcels A' and A was signed in January 2001. A revision to the FOST was completed in March 2002; a second revision was completed in March 2004, and a third revision completed in September 2004. These revisions include a boundary map update, as well as additional information about radiological clearance and other historic activities.

The FOST for Parcel B-1 is currently in draft form and is awaiting finalization and execution in support of property transfer to CCSF. The FOST for Parcel C is scheduled to be drafted in 2017. The FOST for UC-2 was finalized in March of 2015.

3.4 Regional Geology and Description of Fill Material

The Site is located within the Coastal Range geologic province. Regionally, the subsurface is comprised of anthropogenic fill overlying marine deposits and Franciscan bedrock. The marine deposits consist primarily of interbedded silt, sandy clay, and clayey sand. The sandy clay and clayey sand are collectively known locally as the Bay Mud deposits. The bedrock at and in the vicinity of the Site is the Franciscan Formation, which primarily consists of weathered serpentinite, sandstone, and shale. Asbestos is a naturally occurring mineral found in serpentinite and poses a potential health risk if asbestos fibers are mobilized from the serpentinite rock and released into the atmosphere as a result of grading and/or excavation activities.

The peninsula where HPS is located is within a northwest-trending belt of Franciscan formation bedrock known as the Hunters Point Shear Zone. The rocks within this zone are deformed and sheared and consist of serpentinite with sandstone, shale and lesser amounts of chert and greenstone.

On most of Parcel A and the portion of Parcels B-1, C, and UC-2 where work will occur, the bedrock is close to the ground surface with localized areas of overlying fill material. The fill is of two types: bedrock-derived fill from the upland areas of Parcel A' and fill transported to Parcel A by others. In the low-lying areas, the fill is underlain by Bay Mud. Bay Mud consists of soft, organic-rich, plastic clay and silt, with interbedded lenses of sand and peat. Between the lowland area and the bedrock outcrops, the fill directly overlies bedrock.

3.5 Development Scope of Work

Work at the Site consists of four general activities to be conducted over the lifetime of the project:

- Demolition of existing structures and roads;
- Mass grading program;
- Infrastructure improvements (below grade utilities, streets, other surface completions and park construction); and
- Vertical Construction, including fine grading, shoring, foundation construction, and utility service tie-in.

For each of these activities, this ADM/DCP will define minimum mitigation measures to be employed as long as earth disturbing activities are occurring. These mitigation measures are described in greater detail in Section 7.

4. LOCATIONS OF SERPENTINITE-CONTAINING SOIL WITHIN THE SITE

As stated in Section 3.4, bedrock and soil within the Site may contain serpentinite that may or may not contain asbestos fibers at concentrations of concern. For this reason, all development activities that have the potential to disturb bedrock or soil at the Site will be subject to this ADM/DCP.

5. LAND USES WITHIN 0.25 MILE OF WORK SITE WITH SERPENTINE SOILS

Land use within 0.25 mile of the Work Site is generally light/heavy industrial, residential, parks and open space and commercial. For purposes of this ADM/DCP, sensitive land uses are defined as a residence, school, childcare center, hospital or other healthcare facility or group living quarters located within 0.25 miles of the work Site. Within 0.25 mile of the Work Site, potentially sensitive land uses include new residences at the corner of Innes Avenue and Donahue Street and along Innes Avenue at Earl Street. No schools, hospitals or nursing homes are known to exist within 0.25 mile of the Work Site.

6. POTENTIAL SOURCES OF DUST EMISSIONS

While all parties understand that soil disturbance and excavation activities, by their nature will produce dust, which may or may not contain asbestos dust, Site controls will be used to mitigate visible dust as it is generated in an effort to achieve the no visible dust goal. This section lists methods for control of fugitive dust generated by soil disturbance or excavation including:

- Demolition Activities — Wrecking, moving or dismantling of any load-supporting structural member or portion of a building; any related cutting, disjointing, stripping, or removal of structural elements, and crushing of concrete for recycling/reuse.
- Construction Traffic — Movement of construction equipment and/or materials around the Work Site on unpaved travel routes or dirt-covered paved surfaces. Vehicular traffic on paved or unpaved roads and parking lots.
- Site Preparation and Foundation Work — Grading, placement of fill soil, excavation of footings and foundations, installation of shoring and backfilling operations.
- Trenching and Road Construction Activities — Excavation of trenches for the installation of underground utilities.
- Material Stockpiles — Stockpiles of excavated soil from trenching activities or stockpiles of fill material.
- Cleanup and Final Site Grading — Backfilling, grading, and re-vegetating of the excavated areas.
- Any other "Construction," "Grading," "Construction or Grading Operation" or "Construction or Grading Activity" as defined in California Code of Regulations, Title 17, § 93105, subdivision (i)(12).

These activities have the potential to cause dust emissions and related dust mitigation measures applicable to these activities are addressed in Section 7.0.

7. DUST MITIGATION MEASURES

This section describes minimum mitigation measures that must be employed at the Site when earth disturbing activities are taking place. If these minimum mitigation measures are found to be insufficient, additional contingency measures, outlined in Section 7.9, must be implemented.

7.1 Track-out Dust Prevention and Control

Track-out dust results when vehicles leave the Work Site with residual dirt or dust on the tires or undercarriage of the vehicle. This residual dirt or dust becomes deposited on the paved road surfaces leaving the Work Site and can later be stirred up as airborne dust by subsequent vehicle traffic. In order to control track-out, the following control measures will be implemented:

1. Removal of any visible track-out from a paved public road at any location where vehicles exit the work site; this shall be accomplished using wet sweeping or an HEPA filter equipped vacuum device at the end of the work day or at least one time per day.
2. Installation of one or more of the following track-out prevention measures:
    a. a gravel pad designed using good engineering practices to clean the tires of exiting vehicles;
    b. a tire shaker;
    c. an automated wheel wash system;
    d. pavement extending for not less than fifty (50) consecutive feet from the intersection with the paved public road; or
3. Wheel wash stations at areas where vehicles exit onto paved public roads from unpaved roads.
4. Inspection and cleaning of horizontal surfaces on trucks that can collect soil (e.g., bumpers, fenders, etc.).

7.2 Active Soil Storage Piles

A soil storage pile is considered active if material is added to or removed from a soil storage pile within seven calendar days. In order to control fugitive dust emissions from active soil storage piles one or more of the following control measures will be used:

1. Adequately wetting the exposed surface with water; or
2. Use of a temporary cover (plastic sheeting, tarp, etc.).

7.3 Inactive Surface Areas and Storage Piles

Dust emissions from excavations, other exposed soil-disturbed areas, and soil storage piles that will remain inactive for more than seven calendar days shall be controlled by one or more of the following control measures:

1. Adequately wetting the exposed surface with water at a frequency necessary to control dust emissions.
2. Establishing and maintenance of a surface crust sufficient to satisfy the test requirements in Section (h)(6) of the ATCM.
3. Application of chemical dust suppressants or chemical stabilizers according to the manufacturers' recommendations.
4. Covering with tarps or vegetated cover.
5. Installation of wind barriers of fifty (50) percent porosity around three (3) sides of a storage pile.
6. Installation of wind barriers across open areas.

To prevent the general public from accessing soil storage piles, security fencing will be erected and maintained around the Site area where the soil storage piles are located.

7.4 Dust Mitigation for Roads, Parking Lots, and Staging Area

7.4.1 Dust Mitigation Measures for Unpaved Roads, Parking Lots, and Staging Areas

In order to control fugitive dust emissions from construction traffic traveling on unpaved surfaces, the following mitigation measures shall be used.

1. No vehicle will exceed 5 miles per hour (mph) (8 kilometers per hour [km/h]) on unpaved surfaces or 15 mph on paved surfaces within the Work Site. Visible speed limit signs will be posted at the Work Site entrances.
2. One or more of the following:
    a. Watering every 2 hours of active operations or sufficiently often to keep the area adequately wetted;
    b. Applying chemical dust suppressants consistent with manufacturer's directions;
    c. Maintaining a gravel cover with a silt content that is less than five (5) percent and asbestos content that is less than 0.25 percent, as determined using an approved asbestos bulk test method, to a depth of three (3) inches on the surface being used for travel; or
    d. Implementation of erosion control measures identified in the Construction SWPPP, to be provided separately but implemented concurrently, will help control fugitive dust emissions at the Work Site as well as on public roadways, staging areas and parking areas.

7.4.2 Dust Mitigation Measures for Paved Public Roads

The following mitigation measures shall be used to control fugitive dust emissions from construction traffic traveling on paved public roads:

1. No vehicle of any type will be allowed to exit unpaved portions of the Work Site except through treated Work Site exits. For a description of these Work Site exits, see Section 7.1.
2. Construction areas adjacent to and above grade from any paved public roadway will be treated with BMPs, as specified in the Construction SWPPP.

The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit visible dust emissions. Use of blower devices is expressly forbidden.

7.5 Dust Mitigation for Earth Moving Activities

Excavation activities will be visually monitored daily for the generation of fugitive dust. If dust is being generated, water will be applied to the point of excavation or disturbance to control dust.

In order to control fugitive dust emissions generated from earth moving activities the following methods shall be used:

1. Pre-wetting the ground to the depth of anticipated cuts. A dedicated water source (e.g., fire hose) will be used at each point of excavation to ensure that adequate moisture is present to minimize dust generation. This water source will be directed both at the point of excavation and the point of drop off into an awaiting dump truck or an existing soil storage pile, as appropriate.
2. Suspending grading operations when wind speeds are high enough to result in dust emissions crossing the property line, despite the application of dust mitigation measures.
3. Application of water prior to any land clearing.

7.6 Control for Offsite Transport

Any material generated from activities conducted within the Work Site and which material is to be transported off Site must be done so with vehicles that are maintained such that:

1. No spillage can occur from holes or other openings in cargo compartments;
2. The loads are adequately wetted and either:
    a. Covered with a tarp; or
    b. Loaded onto the trucks such that the material does not touch the front, back or sides of the cargo compartment at any point less than twelve (12) inches from the top and that no point of the load extends above the top of the cargo compartment.

Trucks carrying loose soil or sand will be covered before they leave the Work Site. If concrete and/or asphalt are to be hauled off Site, reasonable effort will be made to remove excess soil adhered to the material to be hauled off Site.

7.7 Post-Construction Stabilization

Both the ATCMs and the FEIR 2000 Mitigation Measure 8A, Handling Naturally Occurring Asbestos during Construction, includes details on post-excavation stabilization for exposed serpentine material. When compared, the FEIR 2000 Mitigation Measure 8A is more robust than that specified in the ATCMs. Therefore, this ADM/DCP will utilize the post-construction stabilization measures to achieve compliance with both the ATCMs and FEIR 2000 Mitigation Measure 8A In a memo to SF Planning Department (SFDPH, June 2011) about this mitigation measure, SFDPH Environmental Health Section (EHS) requires that the exposed serpentine material be covered with one of the following cover types:

1. One foot of clean, non-asbestos-containing fill soil (i.e., soil that contains less than 0.25% by-weight asbestos);
2. Hardscape (e.g., sidewalk, road, building foundation).; or
3. Vegetative cover that holds soil in place.

The June 2011 memo also clarifies that MM 8A also specifies "institutional controls" which must be implemented "to prevent future exposure to naturally occurring asbestos from excavation activities." The purpose of the institutional control requirement is to assure that the post-excavation stabilization measure(s) will remain in place as long as the serpentine material is present. SFDPH EHS concludes in their June 2011 memo that the institutional control requirement is satisfied by the ongoing obligation to comply with the Building Code's Construction Dust Control and the Health Code's Article 31 requirements.

In addition, the 2010 Amendments to San Francisco Health Code Article 31 and the corresponding Implementing Regulations contain requirements for submittal of a Serpentinite Cover Plan and the requirement to describe the implementation of this Plan in the required Article 31 Closure Report submittal.

7.8 Off-Site Transportation

If surplus soil and/or rock is to be transported off Site, it will first be analyzed for asbestos content along with other analytes to gain acceptance into an appropriate disposal facility.

If surplus soil and/or rock is scheduled for off haul and disposal, the following waste management methods, at a minimum, will be used when handling the material:

1. Keep the material adequately wetted at all times during handling and loading.
2. Adhere to requirements of BAAQMD Regulation11, Rule 2, Section 608 for marking of vehicles used to transport asbestos-containing waste, if present.
3. Maintain waste shipment records as specified in BAAQMD Regulation 11, Rule 2, Section 502.
4. Provide a copy of the waste shipment record to the disposal site owner or operator upon delivery.
5. Contact transporter and/or owner of the disposal site if the waste shipment has not arrived within 35 days of initial acceptance by the transporter as hazardous waste.
6. Provide a written report to the Air Pollution Control Officer (APCO) if the waste shipment is not received within 45 days of initial acceptance by the transporter

7.9 Contingency Dust Control Measures

In the event the above measures are not successful in controlling dust emissions from the construction activities, one or more of the following activities will be considered and implemented until the condition stabilizes and as based on air monitoring levels criteria described in Section 8.1.7:

- Any designated haul roads will be watered more frequently as necessary to control windblown dust and dust generated by construction vehicle traffic when in use by the contractor.
- Streets adjacent to the Work Site locations will be swept as necessary to remove accumulated dust and soil. Only wet sweeping methods or an HEPA filter equipped vacuum device will be used. Dry rotary sweeping methods will not be used.
- Water may also be applied to paved roads leading between Work Sites, when necessary.
- Vehicle trips will be reduced to the extent practicable.

- Construction employees will park personal vehicles on paved surfaces.
- The construction schedule will be prioritized to the extent possible to install a permanent cap over potentially asbestos-containing soil by the placement of concrete road base and curb/gutter.
- Imported clean aggregate base rock may be used for placement of the final 6 to 12 inches of necessary fill to raise the grade to final subgrade elevation and provide a cover for potentially asbestos-containing soil.
- Paved public roads will be washed at the end of each work day.
- Additional water trucks will be utilized to aid in wetting paved public roads, and Work Site roads as needed, throughout the day.
- Installation of a misting system can be used up to as much as 24 hours per day as needed to aid in keeping soil moist after construction activity has ceased each day.
- Drop heights will be minimized when dropping soil into an awaiting dump truck.
- Periodic watering of haul routes from the point of excavation to the drop-off point regardless of whether the route is paved, unpaved or within or outside the defined Work Site.
- A dedicated laborer will be assigned to each point of excavation to sweep, shovel or otherwise push soil inadvertently dropped on adjacent paved roads within the Work Site. If appropriate, an excavator may be used to push soil back into a trench.
- A mechanical sweeper will be utilized at and around points of active excavation and/or backfill occurring on paved streets to prevent soil from collecting on paved surfaces. This measure will be employed to help control track out of sediment onto paved public streets. Only wet sweeping methods or an HEPA filter equipped vacuum device will be used. Dry rotary sweeping methods will not be used.

If compaction does not take place immediately following clearing and grubbing, the surface soil will be stabilized with dust palliative and water to form a crust on the soil surface.

Graded areas will be stabilized with chemical stabilizers within 5 working days of verification of final grading completion. All unpaved, inactive portions of the Work Site will be seeded and watered to maintain a grass cover if they are to remain inactive for long periods of time.

All clearing, grading, earthmoving, and excavating activities will be halted during periods of sustained strong winds (hourly average wind speeds of 25 mph (40 km/h) or greater).

The areas subject to excavation, grading or other construction activity will be limited at any one time.

In the event blasting is required, the blasting activities will be designed to reduce the potential for fugitive dust emissions. Guidance from the BAAQMD staff report will be followed which may include covering the blast area with wet soil. The amount of soil used will be based on best engineering judgment taking into consideration the amount of the charge, the size of the blast area, and the proximity to receptors and other structures.

Asbestos emissions from demolition activities will be controlled in accordance with the requirements of BAAQMD Section 11-2-303, as described in a separate plan.

8. AIR MONITORING

This section describes the air monitoring protocol to be used at the Site. The monitoring consists of two components: i) airborne asbestos dust monitoring in accordance with the ATCMs, and ii) fugitive dust (particulate) monitoring in accordance with Article 31. Also presented are those specific actions that must be taken by CP DevCo if the level of airborne asbestos is detected at or above project action levels. Airborne asbestos and fugitive dust monitoring locations are depicted in Figure 2.

At the start of the project, airborne asbestos and fugitive dust monitoring are required when earth disturbing activities are active. The ATCMs may allow for a decrease in frequency and possible cessation of airborne asbestos monitoring but only after consultation with, and approval by, BAAQMD staff. SFDPH Article 31 may also allow for a decrease and possible cessation of fugitive dust monitoring, depending on the results of the initial monitoring and the documented compliance of the construction contractor with this Plan. When the project ceases to disturb soil, monitoring may also cease, but only with the proper notifications and/or approvals by SFDPH and BAAQMD.

No airborne asbestos or particulate monitoring is required when the construction Site is shut down, and no work is being conducted and no vehicles are being driven on unpaved surfaces. This is the presumed condition on weekends and holidays. If work is planned for the weekend or on holidays, HPS DevCo will notify the SFDPH and BAAQMD of this plan at least 48 hours prior to the scheduled work. This notification will occur via email.

8.1 Airborne Asbestos Dust Monitoring Program

This section describes the details of the airborne asbestos dust monitoring program.

Section 8.1.2 identifies that the airborne asbestos dust monitoring network will consist of 4 high volume air sampling instruments that are strategically stationed throughout the work area. Section 8.1.4 presents protocol for operating the monitoring stations. If monitoring station(s) detect levels above action levels, earthwork will be suspended until such time that airborne asbestos levels have declined below action levels.

8.1.1 Air Sampling Equipment

Sampling at all airborne asbestos monitoring stations will be conducted using battery operated heavy duty vacuum pumps. Either model SKC 1532 and/or Model BGI 100 or an equivalent model vacuum pump will be used for each of the monitoring stations. The battery will be a marine grade deep cycle 12 volt battery or equivalent. A battery charging station will be set up at a secure location at the Site to ensure adequately charged batteries are always available for pump operation. Selected equipment will be of the type that is used extensively in air sampling for asbestos.

The sampling train will consist of the following a pump, a flow regulator/dampener, a lockable air flow adjustment valve, tygon tubing and filter cassette assembly. The cassette will be attached to a tripod, or equivalent, to ensure the filter cassette maintains a constant elevation of 4 feet above ground surface. The filter cassettes will have a 25 millimeter open face cowl and will consist of a mixed cellulose ester (MCE) filter with a 0.45 micron pore size.

Each of the pumps, battery packs, sampling trains and cassettes will be inspected regularly to ensure proper operation. To prevent vandalism, sampling equipment will be placed in locked boxes and, if possible, behind locked fences. In the event monitors are found to not be operating properly, as soon as practicable BAAQMD staff will be notified of the location, monitor name, time discovered, plan of action and estimated time needed to complete repairs.

8.1.2 Siting of Airborne Asbestos Sampling Devices

A Work Site perimeter airborne asbestos monitoring network using high-volume Total Suspended Particulate (TSP) methodology has been established to measure and document the concentration of airborne asbestos dust in ambient air. Proposed air monitoring stations are depicted in Figure 2. Monitoring stations will be positioned at upwind, downwind and crosswind locations relative to earth disturbing activities.

Airborne asbestos monitoring locations were selected based on locally measured wind speed and direction data as provided by an onsite meteorological station and data provided by a weather station located in close proximity to the Site (i.e., the weather station at SFO). The attached wind rose diagram (Figure 4) illustrates the general historical wind speed, direction and frequency of occurrence at SFO; SFO is located less than 3 miles from the Site. This information was used to establish the location of

local airborne asbestos monitoring stations. Final site airborne asbestos monitoring locations will be selected in cooperation with BAAQMD air monitoring staff.

Airborne asbestos sampling equipment has been located to avoid sheltered or dead air spaces and areas where particle trapping may occur. Sample intake ports are elevated to approximately 4 feet above grade and are placed in areas clear of physical obstructions.

Construction activities may require temporary relocation of airborne asbestos monitors within the vicinity of the locations shown in Figure 2. Should one of the monitors be in direct conflict with construction activities, it may be moved up to 50 feet from its location shown in Figure 2 without notification. Once the construction activities within the conflicting area are complete, the airborne asbestos monitor(s) will be placed back at their originally approved location.

8.1.3 Modifications to Airborne Asbestos Monitoring Program

As new areas within the Site become active and as other areas are stabilized with one of the three methods presented in Section 7.7, it may be necessary to move airborne asbestos monitoring stations to ensure that adequate coverage of active work areas is maintained. If a new area of the Site becomes active that is significantly distant from an existing network, it may be necessary to create a new airborne asbestos monitoring network. If one or more monitors must be moved to maintain coverage or if a new airborne asbestos monitoring network is proposed, the BAAQMD will be notified at least 7 days in advance of the proposed move or proposed addition. In no case will any monitor be moved more than 50 feet without first obtaining approval from the BAAQMD. Other instances that could call for a modification to the airborne asbestos monitoring program may consist of new analytical methodologies, further reduction or possible cessation of monitoring. In any instance, BAAQMD staff must first approve the modification(s) before its implementation in the field.

The notification to the BAAQMD must be in writing and include the following minimum information:

1. The reason(s) for the move;
2. If necessary, the reason(s) for the new monitoring network;
3. A description of new monitoring location(s);

4. A map depicting the current and proposed monitoring locations;
5. A map depicting current and future areas to be disturbed;
6. A description of any other proposed changes to monitoring protocol; and
7. Any other information that will help BAAQMD staff in determining whether the proposal can be approved.

Once the monitoring program modification is approved by BAAQMD, the necessary adjustments will be made in the field, and updated records and communication will be stored with this ADM/DCP at an on Site location.

8.1.4 Sampling Duration and Frequency

Each high-volume air monitoring station, when in operation, will consist of a continuous 24-hour sampling period from approximately 3:30 PM to 3:30 PM the next working day. During holidays and weekends in which no earth disturbing activities occur, air monitoring will not be conducted.

At the time of sample collection and set up for the next monitoring run, a field technician will record in a field notebook the sample ID number, the sample location, the date and time the pump was activated, the date and time the pump was deactivated, the flow rate at the start of sampling, the flow rate at the end of sampling, the calculated average flow rate, and the calculated total volume of air pumped during the sampling run. All data will be transcribed onto the chain-of-custody form that will remain with the samples until they are delivered to the analytical laboratory.

A rotameter will be used to calibrate the flow rate both before and after sample collection. The rotameter will be attached to the end of the sampling train to check the flow rate before the prior day's cassette is removed. This is accomplished by placing a specialized cover over the cowl that allows a rotameter to be attached to the cover in an air-tight fashion. The field technician will read the flow rate and record the reading. After the reading is recorded, the sample cassette is removed, labeled and placed in a sealable plastic bag. Once complete, a new cassette is fitted onto the end of the tygon tubing, the cover placed over the cowl and the rotameter attached to check the flow rate at the start of sampling. If an adjustment is necessary, the technician will adjust the regulator until the desired flow rate is achieved. The desired flow rate is between 2.5 and 2.7 liters per minute.

At the conclusion of set up at all monitoring locations, the samples will be promptly delivered to a California accredited analytical laboratory for analysis. All samples will be accompanied by the chain-of-custody filled out for that day's sampling.

8.1.5 Analytical Method and Procedure

All asbestos air samples will be analyzed by transmission electron microscopy (TEM) per the United States Environmental Protection Agency, Asbestos Hazard Emergency Act (AHERA) criteria pursuant to Title 17 of the California Code of Regulations (17 CCR) Section 93105. The following exceptions are required by the ATCM and will be included:

1. The analytical sensitivity shall be 0.001 structures per cubic centimeter (0.001 s/cc); and
2. All asbestos structures with an aspect ratio greater than three to one (3 to 1) shall be counted irrespective of length.

For purposes of consistency with other adjacent airborne asbestos monitoring programs, the asbestos data will be reported in structures per cubic meter (s/m^3).

8.1.6 Reporting and Data Availability

All results from monitoring stations will be distributed to all project stakeholders via email on a daily basis regardless of the magnitude of the detected concentrations. The email distributions for air monitoring results will include BAAQMD staff, CP DevCo development staff, general contractors working on behalf of CP DevCo, and SFDPH staff.

A cumulative database of all air monitoring results and any on Site wind monitoring data results from project inception to the present will be updated and maintained in the project files. The cumulative air monitoring data will be updated on a monthly basis, and the wind data updated on a weekly basis. These data compilations can be made available to BAAQMD and SFDPH staff upon their request.

8.1.7 Air Monitoring Triggered Dust Mitigation Measures

In the event that ambient air monitoring results indicate levels equal to or above 16,000 s/m^3 from any BAAQMD-approved air monitor, CP DevCo shall notify the BAAQMD

as soon as practical of the monitoring results indicating: the project RIN, sampler ID and location, actual TEM structures per cubic meter, the date the sample was taken and the date analysis was reported. Additionally, all earth-disturbing activity within the monitoring network in which the level of airborne asbestos was detected at or above 16,000 s/m^3 will be suspended until dust is abated and the restart criteria is achieved.

8.2 Fugitive Dust Monitoring Program

Fugitive dust monitoring will be conducted by visual and mechanical means throughout the duration of construction and earthwork. Daily visual monitoring during all earth disturbing activities is the primary responsibility of the contractor. If criteria are exceeded regarding dust generation at the point of earth disturbance, the contractor must follow the processes outlined in Section 7.0 to rectify the particular operation causing the problem.

8.2.1 Perimeter Air Monitoring Instruments

The prevailing wind at Hunters Point is from the west or southwest and towards the east or northeast, as shown in Figure 4. Monitoring locations will initially coincide with those selected for the airborne asbestos dust monitoring program (see Section 8.1). Fugitive dust monitoring locations will be regularly checked and adjusted if necessary to maintain downwind coverage.

Real-time particulate dust monitors with data logging capabilities will be used to monitor for particulates. The action level and details of the monitoring instruments, locations, and the monitoring frequency will be memorialized by CP DevCo based on the Particulate Monitoring System and Approval Form attached in Appendix C. The details of the system (layout, number of monitors, etc.) can be changed, as needed. The use of this Appendix C form and the ability to change the parameters of the monitoring are intended to allow flexibility in the overall objectives of the particulate monitoring program while still meeting or exceeding all health standards. Once the Appendix C form is completed and prior to construction start, it will be submitted to SFDPH for their records.

National Ambient Air Quality Standards (NAAQS) and the California State Ambient Air Quality Standards (CSAAQS) are designed to protect the general public from airborne particulates generated in the urban, suburban and rural environments. The NAAQS and the CSAAQS are not meant to be applied to project specific actions and

related air quality. Rather, those standards are used in an attempt to attain city or region-wide ambient air quality goals for the benefit of the general public. The current standards are:

- 24 Hour National Ambient Air Quality Standard
    - PM-10: 150 micrograms per cubic meter average per 24 hour day (Not to be exceeded more than once per year on average over three years)
    - PM-2.5: 35 micrograms per cubic meter average per 24 hour day (98th percentile, averaged over three years)
- 24 Hour State Ambient Air Quality Standard
    - PM-10: 50 micrograms per cubic meter average per 24 hour day

It should be noted that the City and County of San Francisco (CCSF) is a non-attainment area for the NAAQS for PM-2.5. CCSF is also a non-attainment area for the CSAAQS for PM-10. Non-attainment areas are areas of the country where air pollution levels persistently exceed the NAAQS as designated by U.S. Environmental Protection Agency (USEPA.)

8.2.2 Visible Dust Monitoring During Site Activities

This section establishes the steps that must be taken toward achieving the goal of no visible dust from soil disturbance or excavation in terms of the amount of time permitted to address visible dust plumes. The criteria in this section apply to an active Construction Site when equipment and personnel are driving on the Site and performing work activities. The "initial observation" starts the clock for the required response measures described below. The "initial observation" is the time any of the following personnel observe visible dust: (a) workers who are disturbing soils or excavating for the permitted activity or (b) any CP DevCo representative, supervisor, contractor, subcontractor or consultant with responsibility for monitoring the permitted activity including the independent third party.

8.2.3 Visible Dust Crossing the Property Boundary

In the event visible dust from soil disturbance or excavation is observed crossing the property boundary, the following procedures will be followed to ensure adequate mitigation measures are in place to address the dust:

1. The specific source of the emissions will be immediately shut down, and a more aggressive application of the existing mitigation measures described in this Section 4 will be directed.
2. Once the mitigation measures have been applied, the source of emissions will resume, and observations will be conducted to verify that the mitigation measures were successful.

8.2.4 On-Site Visible Dust

In the event visible dust from soil disturbance or excavation is observed on-site, but does not cross the property boundary, the following procedures will be followed to ensure adequate mitigation measures are in place to address the dust:

1. A more aggressive application of the existing mitigation measures described in this Section 7.4 or additional methods of dust suppression will be directed to the specific source of emissions within 60 minutes of the initial observation.
2. If, despite these more aggressive and/or additional measures, the visible dust emissions continue for 90 minutes from the time of the initial observation, the specific source of emissions will be temporarily shut down until the implemented dust control mitigation is effective or, due to changed conditions, no longer necessary.

8.2.5 Windblown Visible Dust during Inactive Periods

The standards in this section apply to weekends, holidays, or any other times when no equipment and personnel are performing work activities at the Construction Site. In the event of observations of windblown visible dust plumes from soils originating on the Construction Site, mitigation measures described in this Section 7 will be directed by the contractor within less than 4 hours of making the observation. Mitigation measures will be applied until the visible dust plumes originating from the Construction Site are minimized or eliminated. Any observations of visible dust originating from the Construction Site during inactive periods should be reported to the CP DevCo Hotline at 866-5-Lennar.

8.3 Independent Third Party Inspections

An independent third party will observe the potential dust generating activities and implementation of the ADM/DCP mitigation requirements and make notations on the Inspection Checklist (Appendix D). The details of the independent third party observation schedule can be changed as needed to maintain sufficient variability in inspection time. This variability in inspection time has been found to be an effective means to ensure proper contractor response when administering dust mitigation measures.

The checklist results will be reviewed with the contractor on a regular basis. The Independent Third Party will submit the checklists to CP DevCo and SFDPH on a regular basis. The schedule for inspections, review, and submittal of the checklists will be specified through the Particulate Monitoring System Approval Form (Appendix C).

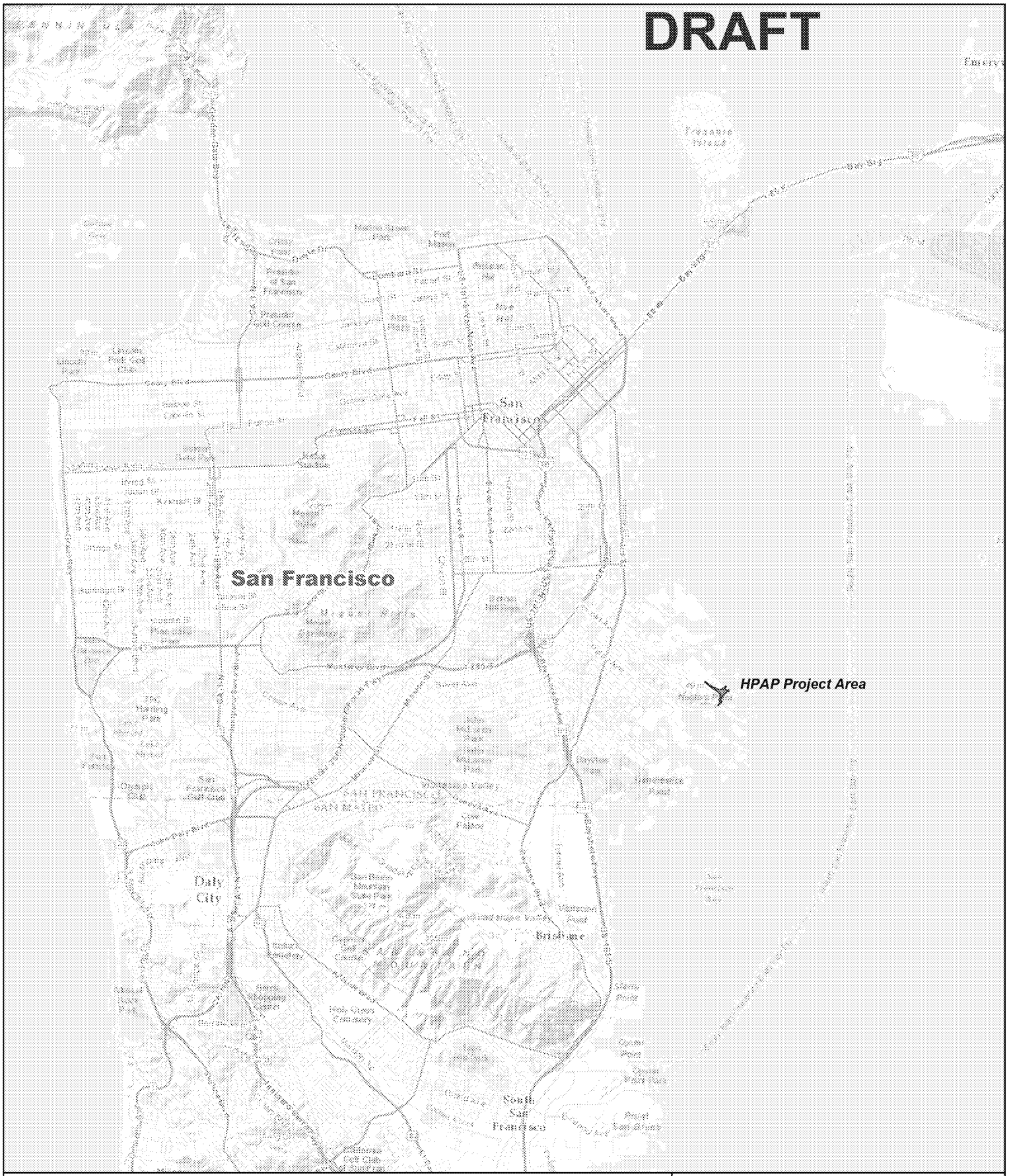
The Hunters Point Project area and San Francisco in general is subject to significant daily variation in wind direction and speed. For example, the wind can be calm in the morning and can then increase significantly in the afternoon. Wind direction will be determined by a wind sock, nearby weather station data, or other similar wind direction monitoring device. This variation in daily wind direction and speed will be documented on the Appendix D checklist. The Appendix D checklist also contains information concerning site activities, descriptions of specific dust mitigation measures and any recommendations for enhanced mitigation measures if found to be necessary. Shut down periods that occur during normal work hours will be noted on the Inspection Checklist or another report.

8.4 Community Relations

The Community is encouraged to assist in monitoring and reporting conditions that are not in compliance with this ADM/DCP. A publicly visible sign with the telephone number to contact regarding dust, noise, or odor complaints will be posted prior to starting construction and maintained during construction. For general complaints, the contractor will respond and take corrective action within 24 hours.

During hours of active construction, phone calls will be answered or returned as soon as practicable. During non-work hours, phone calls may be diverted to a message machine and returned the next business day.

FIGURES



Legend

0 8,000 Feet

N

Site Location Map

Hunters Point Artist Parcels
San Francisco, California

Geosyntec consultants

WR1247 | April 2015

Figure 1

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Site Plan and Monitoring Location Map

Hunters Point Artist Parcels
San Francisco, California

Geosyntec consultants

Figure 2

WR1247 | April 2015

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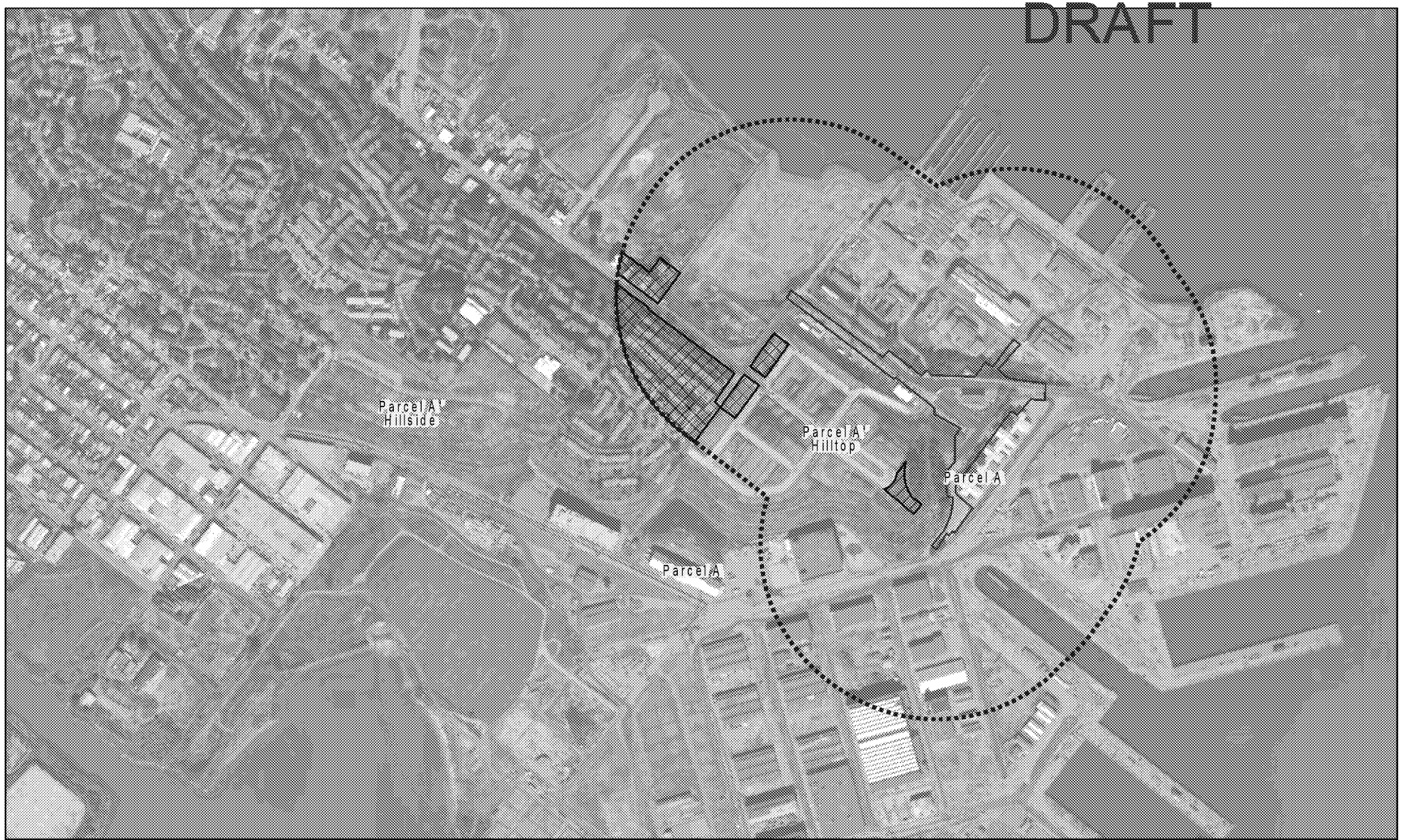
WR1247



Legend

- 1000 Foot Buffer
- Sensitive Receptor
- HPAP Project Area Boundary

N

0 800 Feet

1000 Foot Buffer and Sensitive Receptors

Hunters Point Artist Parcels
San Francisco, California

Geosyntec consultants

WR1247 | April 2015

Figure 3

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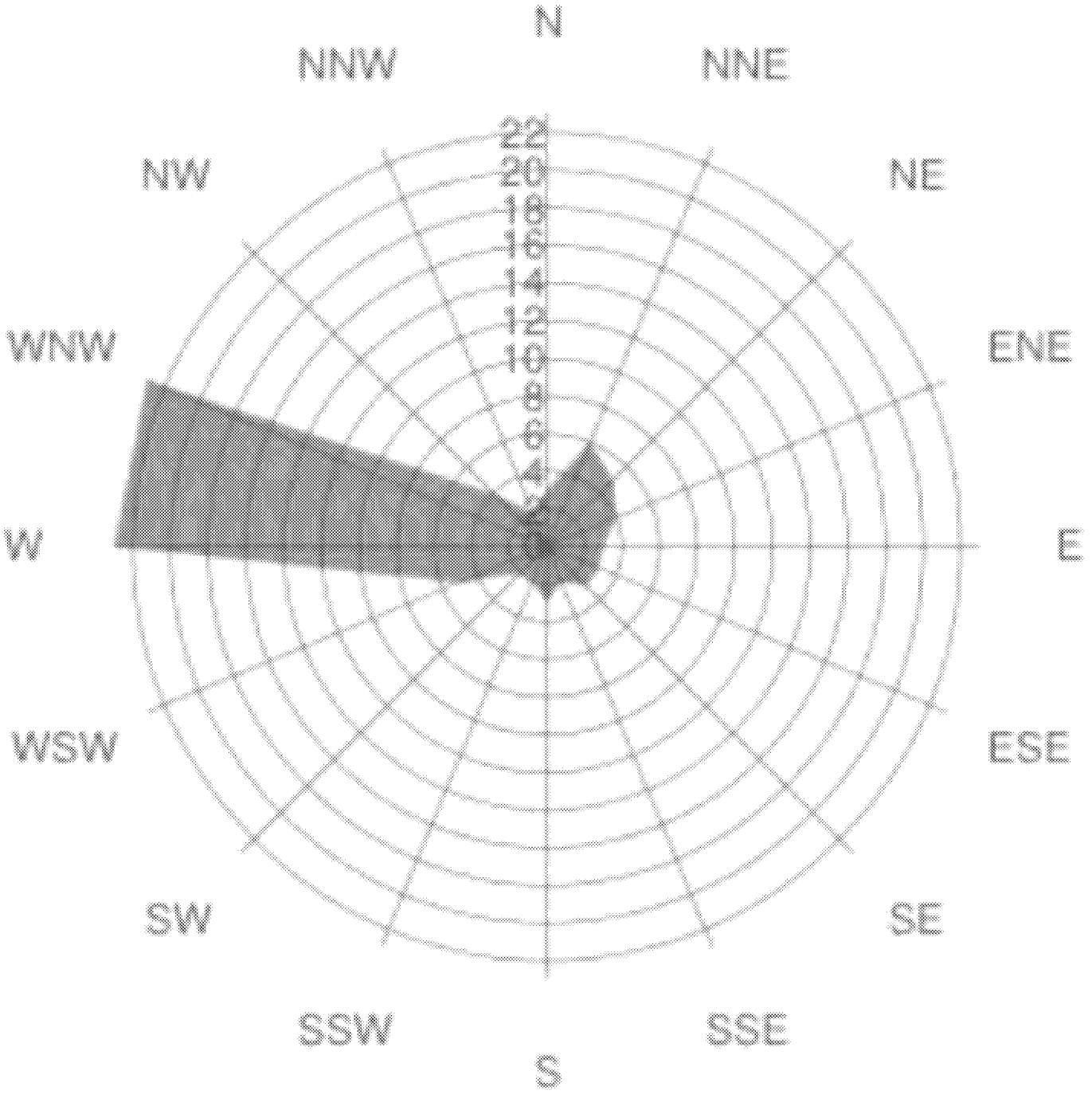
DRAFT



Wind rose represents data recorded at San Francisco International Airport between 11/2006 and 1/2014.

	Wind Rose Diagram Hunters Point Artist Parcels San Francisco, California
	Geosyntec consultants WR1247 | April 2015 Figure 4

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APPENDIX D

Soil Import Plan

Prepared for

CP Development Co., LP
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San Francisco, California 94104

DRAFT SOIL IMPORT PROTOCOL

PHASE II DEVELOPMENT AREA
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

Prepared by

Geosyntec consultants

engineers | scientists | innovators

1111 Broadway, 6th Floor
Oakland, California 94607

Project Number: WR1247A

April 2015

DRAFT Soil Import Protocol
Phase II Development Area
Hunters Point Shipyard
San Francisco, California

Prepared by

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Randolph C. Brandt, P.G.
Principal

Project Number: WR1247A
April 2015

Geosyntec
consultants

TABLE OF CONTENTS

Geosyntec consultants

TABLES

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

Applicant	CP DevCo
CHHSL	California Human Health Screening Level
COC	chemicals of concern
CP DevCo	CP Development Co., LP
DTSC	Department of Toxic Substances Control
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
Geosyntec	Geosyntec Consultants, Inc.
HPS	Hunters Point Shipyard
NOA	Naturally Occurring Asbestos
OCII	Office of Investment and Infrastructure
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
pCi/g	picocuries per gram
PRGs	Preliminary Remediation Goals
QC	quality control
RMP	Risk Management Plan
ROCs	radiological COCs
ROD	Record of Decision
RSL	Regional Screening Level
SFDPH	San Francisco Department of Public Health
SIP	Soil Import Plan
SVOCs	semivolatile organic compounds
Testing Plan	source-specific soil testing plan
the Site	Hunters Point Shipyard, San Francisco, California
TPH	total petroleum hydrocarbons
VOCs	volatile organic compounds

1. INTRODUCTION

1.1 Document Objective

This Soil Import Plan (SIP) has been prepared by Geosyntec Consultants, Inc. (Geosyntec), on behalf of CP Development Co., LP (CP DevCo), to support redevelopment activities within the Hunters Point Shipyard (HPS) located in San Francisco, California (the Site). This SIP presents a protocol to be followed for verifying and documenting that all soil that is imported to the Site from off-Site sources is free of hazardous substances. The SIP discusses import fill acceptance criteria that will be followed throughout implementation of development activities to ensure that sampling, characterization, and selection of backfill sources are performed in accordance with HPS-specific protocols and applicable laws and regulations regardless of HPS property ownership or transfer status. Under no circumstances should soil be allowed to be imported to the Site unless the protocol presented herein is followed and documented.

The primary purpose of the protocol is to comply with requirements of Article 31 of the San Francisco Health Code and document that soil imported to the Site for use as construction fill is free of hazardous substances that could pose a threat to human health and the environment. The San Francisco Department of Public Health (SFDPH) is the regulatory agency responsible for monitoring and enforcing compliance with Article 31. The SIP will also comply with the HPS Record of Decision (ROD) for each Parcel and Risk Management Plan (RMP), which specifies that any imported soil must meet minimum soil quality standards to be protective of human health and the environment. While it is not possible to develop a protocol that can absolutely guarantee all imported fill is free of hazardous substances, the protocol presented herein should provide sufficient information to document that imported soil is free of known or reasonably expected hazardous substances.

The objectives of this SIP are to:

1. Provide a rationale for collection and analysis of import soil chemical characterization samples.
2. Describe and establish consistent sampling procedures.

3. Establish data gathering, handling, and documentation methods that are precise, accurate, representative, complete, and comparable to meet the standard of practice quality control (QC) requirements.
4. Provide soil import acceptance documentation guidelines.

1.2 Certification

Geosyntec, on behalf of CP DevCo (the Applicant) certifies that this SIP was prepared by a qualified person as outlined in Section E of Article 31 of the San Francisco Health Code. In accordance with Article 31, Geosyntec has determined that, in its judgment and in accordance with standards of the professional practice, the SIP contains the required information, meets the requirements of the guidance documents and laws applicable as of the date of this document, and properly evaluates the required information.

1.3 Intended Users of the SIP

This SIP is intended for CP DevCo or its designees who may perform or oversee soil import within privately owned land in conjunction with the redevelopment of the HPS. It is noted that other entities (subsequent property owners, sub-developers, and maintenance contractors) may perform work on the Property that may involve the import of soil and other construction materials onto the property. Reliance of such other parties on this SIP in relation to soil import activities is at the user's sole risk.

2. PROJECT DESCRIPTION

The Hunters Point Shipyard encompasses 866 acres (420 acres on land and 446 acres under water in San Francisco Bay) and is currently divided into former Parcel A, owned by CP Dev Co and the Office of Investment and Infrastructure (OCII), Successor Agency to the San Francisco Redevelopment Agency, and 11 Navy owned parcels: B, C, D-1, D-2, E, E-2, F, G, UC-1, UC-2, and UC-3 (Figure 1). Parcel A has been identified by CP DevCo as the Phase I development area and the remaining Parcels are identified as the Phase II development area. This SIP is for use within the Phase II development area.

2.1 Construction Scope and Import Materials

Site redevelopment will include construction of mixed use facilities, parks, trails and open space. Mixed use facilities will include high density residential, commercial, research and development, retail land, and public open space uses. In support of this development, CP DevCo will conduct demolition of existing structures, mass grading to alter the current grade of the property, make roadway and utility improvements, and construct building pads, foundations, and structures. Other third party developers may execute vertical development.

Construction activities will include excavation and grading of the existing ground surface. Currently, the grading plans identify that a substantial amount of fill is required to raise the elevation of the ground surface to establish the final grade as shown on Figure 2. To accomplish this objective, fill will be imported from various sources and placed at the Site.

In addition to soil that will be imported for general fill and grading purposes, other construction materials may be imported to the Site that will be subject to this SIP. It is anticipated that the future construction plans may call for the import and placement of the following construction materials:

- Planting soil for landscaped areas.
- Compost.
- Organic ground cover or mulch.
- Decomposed granite or other aggregate cover material.
- Engineered fills including aggregate base.
- Recycled materials such as crushed concrete.
- Drain rock, rip rap, or other aggregate erosion control material.
- Sand backfill for certain utility trenches.

Materials that are commercially available through supply vendors will be documented through obtaining material specification sheets that will be provided by the vendor at the time the material is purchased. If such documentation is not available and, for all fill

soil that is imported to the Site, samples will be collected for chemical testing to verify that the material is free of hazardous substances (see Sections 3.0 and 4.0).

This SIP relates to chemical acceptance of import soil/construction materials only and does not pertain to or address geotechnical acceptance criteria. Geotechnical analysis of soil proposed for import will be performed by others and subject to criteria that are not included herein.

2.2 Imported Soil Volume

To support the HPS Phase II development program, it is anticipated that approximately 1,300,000 cubic yards of clean fill material may be imported to HPS. Approximate cut/fill quantities associated with the initial redevelopment mass grading activities are estimated by Parcel on Figure 2.

3. IMPORT MATERIAL SCREENING PROTOCOL

Article 31 requires that soil and construction materials imported to the Site be assessed to document that hazardous substances are not imported onto the Site. The assessment of import soil will be conducted in accordance with the following documents:

- *Information Advisory Clean Imported Fill Material, Department of Toxic Substances Control. October 2001 (DTSC, 2001 (Appendix A).*
- *Hunters Point Shipyard Regulations Under Health Code Article 31. Amended June 15, 2010* (City and County of San Francisco, Department of Public Health, 2010).

Import materials will be verified that they meet the SIP screening protocol by a three-step process that will be followed at each proposed borrow site as follows:

Step 1: Step 1 will consist of a preliminary screening of the environmental conditions at the proposed borrow source site, in the case of soil import, or request vendor documentation in the case of construction material import. In the event that preliminary screening information indicates that import soil or construction material has the potential to contain hazardous substances as a result of past land uses or natural conditions (e.g., naturally occurring asbestos,

naturally occurring metals, etc.) the process will proceed to Step 2 (see Section 3.1).

Step 2: Collect and chemically analyze soil/construction material samples from the borrow site/vendor for potential hazardous substances as described in the DTSC Advisory (Appendix A) and in accordance with Article 31 (see Section 3.2). The results of the sampling and analysis program will be carried into Step 3.

Step 3: Compare the chemical analytical results against applicable environmental soil screening criteria and make a determination on the suitability of the soil for import (see Section 3.3). The details of each of these steps are outlined in the following sections.

3.1 Step 1 – Preliminary Source Screening

Prior to soil and/or construction material being imported to the Site, the following information should first be requested from the owner or contractor in control of the property from which the soil will be exported (borrow source) or from which the construction material will be purchased (vendor):

1. Phase I Environmental Site Assessment (ESA) for the borrow source.
2. Phase II ESA for the borrow source, if available.
3. Soil Management Plans (developed for off-haul of Site soils) for the borrow source, if available.
4. Vendor documentation certifying that the material is free of hazardous substances.

It will be the responsibility of the borrow site owner or the material vendor to provide the requested information. If a Phase I ESA is not available for a borrow site, the borrow site owner shall provide to CP DevCo a site land use history of the borrow source location, prepared by an individual with the requisite training and experience, as described in regulations adopted pursuant to Article 31 of the San Francisco Health Code. The site history shall contain a statement indicating whether the property is listed on the National Priorities List, published by the United States Environmental Protection Agency pursuant to the federal Comprehensive Environmental Response Compensation

and Liability Act, 42 U.S.C. Section 9604(c)(3) or listed as a hazardous substance release site by the California Department of Toxic Substances Control or the State Water Resources Control Board pursuant to the California Hazardous Substances Account Act, California Health and Safety Code Section 25356. The site history shall also include results of a permit records search investigating the history of permitted uses on the site, as well as any known or discovered unpermitted uses or activities on site, to the extent such information is available, which would generate a reasonable expectation that hazardous substances may be present in the soil planned for import.

The Phase I ESA, Phase II ESA, and/or Soil Management Plan provided from the borrow source location should be delivered to CP DevCo's Environmental Manager for review and comment. If CP DevCo's Environmental Manager determines that sufficient information and data exists to appropriately characterize the soil proposed for import, as defined in the DTSC Guidance and Article 31, then the process will proceed to Step 3. Otherwise, the process will proceed to Step 2.

3.2 Step 2 – Soil Sampling and Chemical Analyses

If, based on the findings from Step 1, further soil testing will be necessary, a source-specific soil sampling and chemical testing program will be designed in accordance with the parameters outlined in this SIP. It will be the responsibility of the owner of the proposed borrow source to develop and implement a soil sampling and chemical analysis plan that is acceptable to the SFDPH and CP DevCo. The DTSC advisory will be consulted to ensure an adequate number of soil samples are collected relative to the land use history and volume of soil proposed for import. Details regarding the source-specific Soil Import Material Testing Plan are presented in Section 4.0.

3.3 Step 3 – Chemical Screening Criteria

Sample results will be screened against comparison criteria in accordance with Article 31 as provided in Table 1 and summarized below:

1) Metals, VOCs, SVOCs, PAHs, pesticides, and PCBs use the more stringent of either the most recent California Human Health Screening Level (CHHSL) or the United States Environmental Protection Agency (EPA) Regional Screening Level (RSL) for residential soil.

2) pH use Hazardous Waste Levels for corrosivity as defined in 22 California Code of Regulations 66261.22.

3) TPH in the gasoline, diesel or motor oil ranges use 100, 10, and 500 mg/kg, respectively (based on RWQCB ESLs).

4) Radionuclides use EPA Preliminary Remediation Goals (PRGs) for residual soil with two exceptions: 0.113 picocuries per gram (pCi/g) for Cesium-137 and 1.0 pCi/g for Radium-226 above background or may use 1.485 pCi/g if site specific background is not available.

The specific screening criteria and their source reference are provided in Table 1. Soil that is characterized by concentrations of the constituents of concern that are below the respective screening level will be deemed acceptable for import. Soil with concentrations above screening criteria will be rejected for import. Further details are provided in Section 5.

4. IMPORT MATERIAL TESTING PLAN

If it is determined that Step 2 must be implemented, a source-specific soil testing plan (Testing Plan) will be developed and implemented by the owner of the proposed borrow site. The Testing Plan will be submitted by the borrow site owner to the SFPDH and CP DevCo prior to implementation for review and concurrence. The plan will include a description of the sampling frequency, and an analytical chemical testing program for the chemicals of concern (COCs) that will be targeted for analysis. Each of these elements is described in further detail below.

4.1 Sampling Frequency and Soil Sampling Protocol

4.1.1 Sampling Frequency

In order to design a sampling program, the sampling frequency will be established on the basis of the DTSC Advisory. The DTSC Advisory specifies a sampling frequency that will be consulted to verify that a representative number of soil samples are collected relative to the volume of proposed import soil. The DTSC Advisory provides guidance on the minimum sampling frequency, based on either an in-place characterization of soil or characterization of a soil stockpile. The minimum sample frequency requirements adopted from the DTSC Advisory are summarized in Table 2.

Table 2 – Minimum Sample Frequency Requirements

In-Place Borrow Source Area	**Sample Frequency**
Site 2 acres or less	4 samples
Site 2 to 4 acres	1 sample every ½ acre
Site 4 to 10 acres	8 samples
Site greater than 10 acres	32 samples
Borrow Source Volume	**Sample Frequency**
Stockpile up to 1,000 cubic yards	1 sample per 250 cubic yards
Stockpile 1,000 to 5,000 cubic yards	4 samples for first 1000 cubic yards plus 1 sample per each additional 500 cubic yards
Stockpile greater than 5,000 cubic yards	12 samples for first 5,000 cubic yards plus one sample per each additional 1,000 cubic yards

4.1.2 Soil Sampling Procedures

All soil sampling activities must be conducted by properly experienced personnel using industry standard protocols and under the oversight of an appropriately licensed (California Registered) engineer or geologist. Soil samples may be collected using a trowel, hand auger, direct push drilling rig or other approved method and in accordance with SW 846. The soil samples collected for all analysis except VOCs will be placed in laboratory supplied sampling jars, brass tubes with end caps, or acetate sleeves with end caps for transport to the analytical laboratory. When collecting soil samples for VOCs, EPA Method 5035 must be utilized. Any results for VOC analysis conducted on soil samples collected without the above noted protocol will most likely be rejected.

Import soil characterization samples for chemical analysis must be collected as discrete soil samples. When appropriate and upon concurrence from SFDPH and CP DevCo, discrete samples may be composited by the laboratory for chemical analysis as composited samples.

Sample containers will be sealed and packaged in accordance with Section 4.5. After packaging, samples will be stored in a cooler with ice for transport to the analytical

laboratory under standard chain of custody procedures. Field documentation will be filled out during sample collection.

4.1.3 Decontamination Procedures

Non-dedicated sampling equipment that contacts samples will be decontaminated to prevent the introduction of extraneous material into samples and to prevent cross-contamination between samples. Sampling equipment will be decontaminated using a three bucket wash/rinse procedure as follows:

1. Particulate matter and debris will be removed from the equipment.
2. The equipment will first be washed in potable water with a Liquinox or Alconox solution.
3. The equipment will then be rinsed in potable water.
4. Finally the equipment will be rinsed in deionized water.

4.1.4 Sample Numbering and Labeling

Each sample will be assigned a unique sample number, which will be recorded on the field notes, sample labels, and the chain-of-custody form at the time of sample collection. A complete description of the sample and sampling conditions will be recorded in the field notes.

Sample labels will be printed in ink. All corrections must be made using standard single-line cross-out methods and the initials of the sampler. Sample labels will be affixed directly to each sample container to a non-sealing portion of the container. Each sample label will contain, at a minimum, the following information:

- Sample identification number
- Sample collection date (month/day/year)
- Time of collection (24-hour clock)
- Company name
- Project number/name

- Sampler's initials
- Preservation (if any)
- Analyses to be performed (EPA method number)

4.1.5 Sample Packaging and Shipment

Sample packaging and shipment procedures for this project will adhere to the U.S. Department of Transportation and International Air Transport Association procedures, as applicable for packaging. All glass sample containers will first be protected with bubble wrap if transported by overnight courier.

Samples will be transported in coolers with sufficient ice and a temperature blank. A temperature blank is a vial filled with tap water and stored in the cooler during sample collection and transportation. The laboratory will record the temperature of the cooler and temperature blank on the chain-of-custody record immediately upon receipt of the samples.

4.1.6 Sample Chain of Custody

The chain-of-custody will be the controlling document to ensure that sample custody is maintained. Upon collecting a sample, sampling personnel will complete the chain-of-custody record in the field.

The chain-of-custody records will be completed, signed, and distributed as follows:

- A minimum of one copy sent to the analytical laboratory with the sample shipment.
- A minimum of one copy retained for inclusion in the project files.

Each time the sample custody is transferred, the former custodian will sign the chain-of-custody record on the "Relinquished By" line, and the new custodian will sign the chain-of-custody record on the "Received By" line. The date, time, and project or company affiliation will accompany each signature.

Once the samples arrive at the state certified analytical laboratory, laboratory personnel will sign the chain-of-custody record documenting transfer of the samples to the

laboratory. Laboratory personnel will note discrepancies with the original chain of custody, sample receipt, temperature of the cooler, and broken sample containers.

4.2 Chemical Testing Program

All soil samples will be tested for all or a subset of the COCs identified on Table 1, depending on the potential for their presence based on land use history of the borrow site and the ate placement location of the imported material on HPS. All samples collected from a borrow area will be tested for the COCs that have been identified on the basis of historical land use (i.e., residential/commercial land, agricultural land, land near a quarry, land near a freeway, etc.). The DTSC Advisory specifies laboratory analyses for potential hazardous substances, based on the historical land use at the borrow source location, as follows:

- Fill sourced from a quarry will be analyzed for metals, total petroleum hydrocarbons (TPH), asbestos, and pH.
- Fill sourced from residential and commercial land will be analyzed for metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), TPH, asbestos, and pH.
- Fill sourced from near an existing freeway will be analyzed for lead and polycyclic aromatic hydrocarbons (PAHs).
- Fill sourced from agricultural land will be analyzed for organochlorine pesticides, organophosphorus pesticides, chlorinated herbicides, and metals.

If a borrow site land use is other than above, the owner will consult with the SFDPH and CP DevCo as to the appropriate land use COCs to be tested.

In addition to the land use COCs, a subset of the samples will be tested for the full suite of COCs identified in Article 31 (Article 31 COCs) and the radiological COCs (ROCs). Soil samples will be analyzed at the following frequencies from each borrow source site and as summarized in Table 3 below:

1. Land Use COCs will be tested at 100% of the soil samples collected.
2. Article 31 COCs will be sampled at 50% of the soil samples collected.
3. ROCs will be sampled at 25% of the soil samples collected.

Table 3: Chemical Testing Plan

Borrow Area/Volume	Land Use COCs	Article 31 COCs	ROCs
Site 2 acres or less	100% of all samples but no less than 4 samples	50% of all samples but no less than 3 samples	25% of all samples but no less than 3 samples
Site 2 to 4 acres	100% of all samples but no less than 1 sample every ½ acre	50% of all samples but no less than 3 samples	25% of all samples but no less than 3 samples
Site 4 to 10 acres	100% of all samples but no less than 8 samples	50% of all samples but no less than 4 samples	25% of all samples but no less than 3 samples
Site greater than 10 acres	100% of all samples but no less than 32 samples	16 samples	25% of all samples but no less than 8 samples
Stockpile up to 1,000 cubic yards	100% of all samples but no less than 1 sample per 250 cubic yards	50% of all samples but no less than 1 sample per 250 cubic yards, up to 3 samples	25% of all samples but no less than 1 sample per 250 cubic yards, up to 3 samples
Stockpile 1,000 to 5,000 cubic yards	100% of all samples but no less than 4 samples for first 1000 cubic yards plus 1 sample per each additional 500 cubic yards	50% of all samples but no less than 3 samples for first 1000 cubic yards plus 1 sample per each additional 1,000 cubic yards	25% of all samples but no less than 3 samples
Stockpile greater than 5,000 cubic yards	100% of all samples but no less than 12 samples for first 5,000 cubic yards plus one sample per each additional 1,000 cubic yards	50% of all samples but no less than 6 samples for first 5,000 cubic yards plus one sample per each additional 2,000 cubic yards	25% of all samples but no less than 3 samples for the first 5,000 cubic yards plus one sample per each additional 4,000 cubic yards

Soil samples will be analyzed by a California State Certified Laboratory. The following analytical methods will be used for analysis:

- Heavy metals (i.e., CAM 17 metals) by EPA Method 6000/7000 Series.
- Mercury by EPA Method 7471A.

- Fluoride salts by EPA Method 9056.
- TPH by EPA Method 8260 (gasoline range) and 8015M (diesel and motor oil range).
- Asbestos by CARB 435 Method.
- VOCs by EPA Method 8260B, 1-4 dioxane by 8081A.
- SVOCs including PAHs by EPA Method 8270C, Benzo(a)pyrene by 8081A.
- Pesticides by EPA Method 8081A/8080A.
- PCBs by EPA Method 8082.
- pH by EPA Method 9040.
- Cesium-137, Cobalt-60, and Radium-226, by modified EPA Method 901.1.
- Strontium-90 by modified EPA Method 905.

When analytical results become available, all analytical laboratory reports and chain of custody records must be provided to CP DevCo for their review and approval. If available, a sample location map depicting discrete sample locations and export location and/or stockpile dimensions should accompany the laboratory reports.

5. IMPORT SOIL ACCEPTANCE

Following receipt by CP DevCo of analytical laboratory reports from the borrow site owner, CP DevCo will compare the data against the established screening criteria in Table 1. Three possible evaluation designations may result from the evaluation of data:

Category 1: Analyte concentrations are less than comparison criteria and analytes without comparison criteria are not detected.

Category 2: Analyte concentrations are less than comparison criteria and detected analytes without comparison criteria are deemed "acceptable". Acceptability will be established by comparing the result with ROD cleanup criteria, the constituent's relative toxicity characteristics, and in consultation with the SFDPH.

Category 3: One or more analyte concentrations exceed comparison criteria or detected analyte concentrations without comparison criteria are deemed "unacceptable". Any

borrow source that is designated as Category 3 will be rejected without further evaluation.

Results of the review will be recorded on the Backfill Review and Approval Form. This Form was developed from the Hunters Point Shipyard Project Backfill Review and Acceptance Procedures (Tetra Tech EC Inc., 2006). The following information will be attached to The Backfill Review and Approval Form provided in Appendix B:

- Import soil source.
- Relevant source sample numbers.
- Planned use of the import soil.
- Relevant sections from this SIP and project specifications (i.e., comparison criteria tables).
- Laboratory reports.
- Evaluation summary table.
- Material classification.

Backfill Review and Approval Forms will be submitted to the San Francisco Department of Public Health (SFDPH) for concurrence prior to the soil arriving on the Site. All import soils must be pre-approved by CP DevCo with concurrence by the SFDPH prior to import.

6. REFERENCES

California Department of Toxic Substances Control (DTSC), 2001. Information Advisory Clean Imported Fill Material, October.

Department Of Toxic Substances Control (DTSC), 2004. Interim Guidance, Naturally Occurring Asbestos (NOA) at School Sites, Revised 24 September.

City and County of San Francisco, Department of Public Health, 2010. Hunters Point Shipyard Regulations Under Health Code Article 31, Adopted 2004, Amended 15 June.

Duverge, Dylan Jacques, 2011. Background Arsenic Concentration in San Francisco Bay Region soils. Master's Thesis, Establishing Background Arsenic in Soil of the Urbanized San Francisco Bay Region, December.

Tetra Tech EC Inc., 2006. "Hunters Point Shipyard Project Backfill Review and Acceptance Procedure (HPO-Tt-0270)," 13 April.

TABLES

Table 1
Screening Criteria
Hunters Point Naval Shipyard
San Francisco, California

Inorganic persistent and bioaccumulative toxic substances; 22 Cal Code Regs § 66261.24			
Analyte	Analytical Method	Screening Criteria (mg/kg)	Screening Criteria Reference
Antimony and/or antimony compounds	EPA Method 6010B/6010C	30	CHHSL
Arsenic and/or arsenic compounds	EPA Method 6010B/6010C	11	CHHSL
Asbestos (as percent)	CARB 435 Method	0.25%	DTSC[1]
Barium and/or barium compounds (excluding barite)	EPA Method 6010B/6010C	5200	CHHSL
Beryllium and/or beryllium compounds	EPA Method 6010B/6010C	150	CHHSL
Cadmium and/or cadmium compounds	EPA Method 6010B/6010C	1.70	CHHSL
Chromium (VI) compounds	EPA Method 6010B/6010C	0.30	RSL
Chromium and/or chromium (III) compounds	EPA Method 6010B/6010C	100000	CHHSL
Cobalt and/or cobalt compounds	EPA Method 6010B/6010C	23	RSL
Copper and/or copper compounds	EPA Method 6010B/6010C	3000	CHHSL
Fluoride salts	EPA Method 9056	3100	RSL
Lead and/or lead compounds	EPA Method 6010B/6010C	150	CHHSL
Mercury and/or mercury compounds	EPA Method 7471A	18	CHHSL
Molybdenum and/or molybdenum compounds	EPA Method 6010B/6010C	380	CHHSL
Nickel and/or nickel compounds	EPA Method 6010B/6010C	1500	RSL
Selenium and/or selenium compounds	EPA Method 6010B/6010C	380	CHHSL
Silver and/or silver compounds	EPA Method 6010B/6010C	380	CHHSL
Thallium and/or thallium compounds	EPA Method 6010B/6010C	0.78	RSL
Vanadium and/or vanadium compounds	EPA Method 6010B/6010C	390	CHHSL
Zinc and/or zinc compounds	EPA Method 6010B/6010C	23000	CHHSL
Aluminum	EPA Method 6000/7000 Series	77000	RSL
Iron	EPA Method 6000/7000 Series	55000	RSL
Manganese	EPA Method 6000/7000 Series	1800	RSL
Sodium	EPA Method 6000/7000 Series	3900	RSL
Volatile organic toxic pollutants listed in 40 C.F.R. Part 122, Appendix D, Table II			
Analyte	Analytical Method	Screening Criteria (mg/kg)	Screening Criteria Reference
acrolein	EPA Method 8260B	0.14	RSL
acrylonitrile	EPA Method 8260B	0.25	RSL
benzene	EPA Method 8260B	1.20	RSL
bromoform	EPA Method 8260B	67	RSL
carbon tetrachloride	EPA Method 8260B	0.65	RSL
chlorobenzene	EPA Method 8260B	280	RSL
chloroform	EPA Method 8260B	0.32	RSL
dichlorobromomethane	EPA Method 8260B	7.60	ESL
1,4 Dioxane	EPA Method 8081A	5.30	RSL
1,1-dichloroethane	EPA Method 8260B	3.60	RSL
1,2-dichloroethane	EPA Method 8260B	0.46	RSL
1,1-dichloroethylene	EPA Method 8260B	230	RSL
1,2-dichloropropane	EPA Method 8260B	1.00	RSL
1,3-dichloropropylene	EPA Method 8260B	0.27	ESL
ethylbenzene	EPA Method 8260B	5.80	RSL
methylene chloride	EPA Method 8260B	57	RSL
1,1,2,2-tetrachloroethane	EPA Method 8260B	0.60	RSL
tetrachloroethylene	EPA Method 8260B	24	RSL
toluene	EPA Method 8260B	4900	RSL
1,2-trans-dichloroethylene	EPA Method 8260B	1600	RSL
1,1,1-trichloroethane	EPA Method 8260B	8100	RSL
1,1,2-trichloroethane	EPA Method 8260B	1.10	RSL
trichloroethylene	EPA Method 8260B	0.94	RSL
vinyl chloride	EPA Method 8260B	0.06	RSL
chloroethane	EPA Method 8260B	1.10	ESL
2-chloroethylvinyl ether	EPA Method 8260B	n/a	RSL
methyl bromide	EPA Method 8260B	n/a	ESL
methyl chloride	EPA Method 8260B	n/a	ESL
Hexachlorobutadiene	EPA Method 8260B	6.80	RSL
Methyl tert-butyl ether (MTBE)	EPA Method 8260B	47	RSL
m-Xylene	EPA Method 8260B	550	RSL

Table 1
Screening Criteria
Hunters Point Naval Shipyard
San Francisco, California

Volatile organic toxic pollutants listed in 40 C.F.R. Part 122, Appendix D, Table II (cont.)			
Analyte	Analytical Method	Screening Criteria (mg/kg)	Screening Criteria Reference
p-Xylene	EPA Method 8260B	560	RSL
n-Butylbenzene	EPA Method 8260B	3900	RSL
Propyl benzene	EPA Method 8260B	3300	RSL
o-Xylene	EPA Method 8260B	650	RSL
Styrene	EPA Method 8260B	6000	RSL
1,3-Dichloropropene	EPA Method 8260B	1.80	RSL
Trichlorofluoromethane (Freon 11)	EPA Method 8260B	730	RSL
Hexachlorobutadiene	EPA Method 8260B	6.80	RSL
cis-1,2-Dichloroethene	EPA Method 8260B	160	RSL
2-Chlorotoluene	EPA Method 8260B	1600	RSL
2-Hexanone	EPA Method 8260B	200	RSL
4-Chlorotoluene	EPA Method 8260B	1600	RSL
4-Methyl-2-pentanone (MIBK)	EPA Method 8260B	5300	RSL
acetone	EPA Method 8260B	61000	RSL
bromobenzene	EPA Method 8260B	290	RSL
Bromochloromethane	EPA Method 8260B	150	RSL
Bromodichloromethane	EPA Method 8260B	0.29	RSL
Bromoform	EPA Method 8260B	67	RSL
Bromomethane	EPA Method 8260B	6.80	RSL
Carbon disulfide	EPA Method 8260B	770	RSL
Chloromethane	EPA Method 8260B	110	RSL
Dibromochloromethane	EPA Method 8260B	0.73	RSL
Dibromomethane	EPA Method 8260B	23	RSL
Dichlorodifluoromethane	EPA Method 8260B	87	RSL
1,1,1,2-Tetrachloroethane	EPA Method 8260B	2	RSL
1,2,3-Trichlorobenzene	EPA Method 8260B	49	RSL
1,2,3-Trichloropropane	EPA Method 8260B	0.0051	RSL
1,2,4-Trichlorobenzene	EPA Method 8260B	24	RSL
1,2,4-Trimethylbenzene	EPA Method 8260B	58	RSL
1,2-Dibromo-3-chloropropane	EPA Method 8260B	0.0053	RSL
1,2-Dibromoethane	EPA Method 8260B	0.036	RSL
1,2-Dichlorobenzene	EPA Method 8260B	1800	RSL
1,3,5-Trimethylbenzene	EPA Method 8260B	780	RSL
1,4-Dichlorobenzene	EPA Method 8260B	2.60	RSL
2-Butanone (MEK)	EPA Method 8260B	27000	RSL
PCBs			
Analyte	Analytical Method	Screening Criteria (mg/kg)	Screening Criteria Reference
PCB's (general)	EPA Method 8082	0.09	CHHSL
Aroclor-1016	EPA Method 8082	4.00	RSL
Aroclor-1221	EPA Method 8082	0.15	RSL
Aroclor-1232	EPA Method 8082	0.15	RSL
Aroclor-1242	EPA Method 8082	0.24	RSL
Aroclor-1248	EPA Method 8082	0.24	RSL
Aroclor-1254	EPA Method 8082	0.24	RSL
Aroclor-1260	EPA Method 8082	0.24	RSL
pH levels			
Analyte	Analytical Method	Screening Criteria	Screening Criteria Reference
pH - Non-aqueous	EPA Method 9040	At a minimum, the pH will be less than or equal to 2 or greater than or equal to 12.5 when soil is mixed with an equivalent weight of water (Article 31). More conservative pH ranges (e.g. 5-9) may be applied depending on the use of the backfill material (e.g. topsoil)	
	NACE Standard TM-01-69	when mixed with an equivalent weight of water, produces a liquid that corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55°C (130°F) (Article 31)	

Table 1
Screening Criteria
Hunters Point Naval Shipyard
San Francisco, California

Total petroleum hydrocarbons			
Analyte	Analytical Method	Screening Criteria (mg/kg)	Screening Criteria Reference
gasoline	EPA Method 8260	315	Article 31
diesel	EPA Method 8015M	1500	Article 31
motor oil	EPA Method 8015M	1850	Article 31
Pesticides			
Analyte	Analytical Method	Screening Criteria (mg/kg)	Screening Criteria Reference
2,4-Dichlorophenoxy acetic acid	EPA Method 8081A/8080A	690	RSL
2,4,5-Trichlorophenoxy acetic acid	EPA Method 8081A/8080A	550	CHHSL
Pentachlorophenol	EPA Method 8081A/8080A	0.99	RSL
Aldrin	EPA Method 8081A/8080A	0.03	CHHSL
Chlordane	EPA Method 8081A/8080A	0.43	CHHSL
DDD	EPA Method 8081A/8080A	2.20	CHHSL
DDE	EPA Method 8081A/8080A	1.60	CHHSL
DDT	EPA Method 8081A/8080A	1.60	CHHSL
Dieldrin	EPA Method 8081A/8080A	0.03	RSL
Dioxin (2,3,7,8-TCDD)	EPA Method 8081A/8080A	0.0000046	CHHSL
Endrin	EPA Method 8081A/8080A	18.00	RSL
Endosulfan I	EPA Method 8081A/8080A	370.00	RSL
Heptachlor	EPA Method 8081A/8080A	0.12	RSL
Lindane (gamma-BHC)	EPA Method 8081A/8080A	0.50	CHHSL
Methoxychlor	EPA Method 8081A/8080A	310	RSL
Mirex	EPA Method 8081A/8080A	0.03	RSL
alpha-BHC	EPA Method 8081A/8080A	0.06	RSL
beta-BHC	EPA Method 8081A/8080A	0.30	RSL
Toxaphene	EPA Method 8081A/8080A	0.46	CHHSL
Endosulfan II	EPA Method 8081A/8080A	0.0046	ESL
Heptachlor epoxide	EPA Method 8081A/8080A	0.014	ESL
Kepone	EPA Method 8081A/8080A	0.053	RSL
Radionuclides			
Analyte	Analytical Method	Screening Criteria (pCi/g)	Screening Criteria Reference
Cesium-137	EPA Method 901.1	0.113	Article 31
Cobalt-60	EPA Method 901.1	0.036	USEPA Preliminary Remediation Goals for residential soil
Radium-226	EPA Method 901.1	1.485[2]	Article 31
Strontium-90	EPA Method 905	0.331	USEPA Preliminary Remediation Goals for residential soil
Semi-volatile organic compounds (including PAHs)			
Analyte	Analytical Method	Screening Criteria (mg/kg)	Screening Criteria Reference
1,2-Dichlorobenzene	EPA Method 8270C	1800	RSL
1,4-Dichlorobenzene	EPA Method 8270C	2.60	RSL
2,4,5-Trichlorophenol	EPA Method 8270C	6200	RSL
2,4,6-Trichlorophenol	EPA Method 8270C	48	RSL
2,4-Dichlorophenol	EPA Method 8270C	180	RSL
2,4-Dimethylphenol	EPA Method 8270C	1200	RSL
2,4-Dinitrophenol	EPA Method 8270C	120	RSL
2,4-Dinitrotoluene	EPA Method 8270C	1.70	RSL
2,6-Dinitrotoluene	EPA Method 8270C	0.36	RSL
2-Chlorophenol	EPA Method 8270C	390	RSL
2-Nitroaniline	EPA Method 8270C	610	RSL
3,3'-Dichlorobenzidine	EPA Method 8270C	1.20	RSL
4-Chloroaniline	EPA Method 8270C	2.70	RSL
4-Nitroaniline	EPA Method 8270C	27	RSL
Benzoic	EPA Method 8270C	250000	RSL

Table 1
Screening Criteria
Hunters Point Naval Shipyard
San Francisco, California

Semi-volatile organic compounds (including PAHs) (cont.)			
Analyte	Analytical Method	Screening Criteria (mg/kg)	Screening Criteria Reference
Benzo(a)pyrene	EPA Method 8081A	0.04	CHHSL
Benzyl (alcohol / chloride)	EPA Method 8270C	6200 / 1.1	RSL
Bis(2-chloroethoxy)methane	EPA Method 8270C	180	RSL
Bis(2-chloroethyl)ether	EPA Method 8270C	0.23	RSL
Hexachlorobenzene	EPA Method 8270C	0.33	RSL
Hexachlorobutadiene	EPA Method 8270C	6.80	RSL
Hexachloroethane	EPA Method 8270C	13	RSL
Isophorone	EPA Method 8270C	560	RSL
Nitrobenzene	EPA Method 8270C	5.10	RSL
n-Nitrosodiphenylamine	EPA Method 8270C	110	RSL
Pentachlorophenol	EPA Method 8270C	0.99	RSL
Phenol	EPA Method 8270C	18000	RSL
2-Chloronaphthalene	EPA Method 8270C	6300	RSL
Bis(2-ethylhexyl)phthalate	EPA Method 8270C	38	RSL
Dibenzofuran	EPA Method 8270C	72	RSL
Diethylphthalate	EPA Method 8270C	n/a	RSL
Di-n-butylphthalate	EPA Method 8270C	n/a	RSL

Notes:
1. Screening level for naturally occurring asbestos at school sites (Department of Toxic Substances Control, 2004)
2. Screening criteria if site specific background value not available. If site specific background available screening criteria is 1 pCi/g above background
3. CHHSLs = California Human Health Screening Levels
4. RSL = EPA Regional Screening Levels (California, Region 9)
5. PAHs = polycyclic aromatic hydrocarbons
6. VOCs = Volatile organic compounds
7. sVOCs = Semi-Volatile organic compounds
8. mg/kg = milligram per kilogram
9. pCi/g = picocuries per gram
10. Environmental Screening Levels (ESLs) were used when both RSL and CHHSLs were not available
11. n/a = not available
12. Analytes shown in gray are not included in Article 31 but have been listed in the Appendix H Backfill Acceptance Plan Remedial Action in Parcel B (ERRG, 2012)

FIGURES

DRAFT

Legend

N

0 800 Feet

Aerial Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Parcel Location Map

Soil Import Plan
Hunters Point, Shipyard, San Francisco, CA

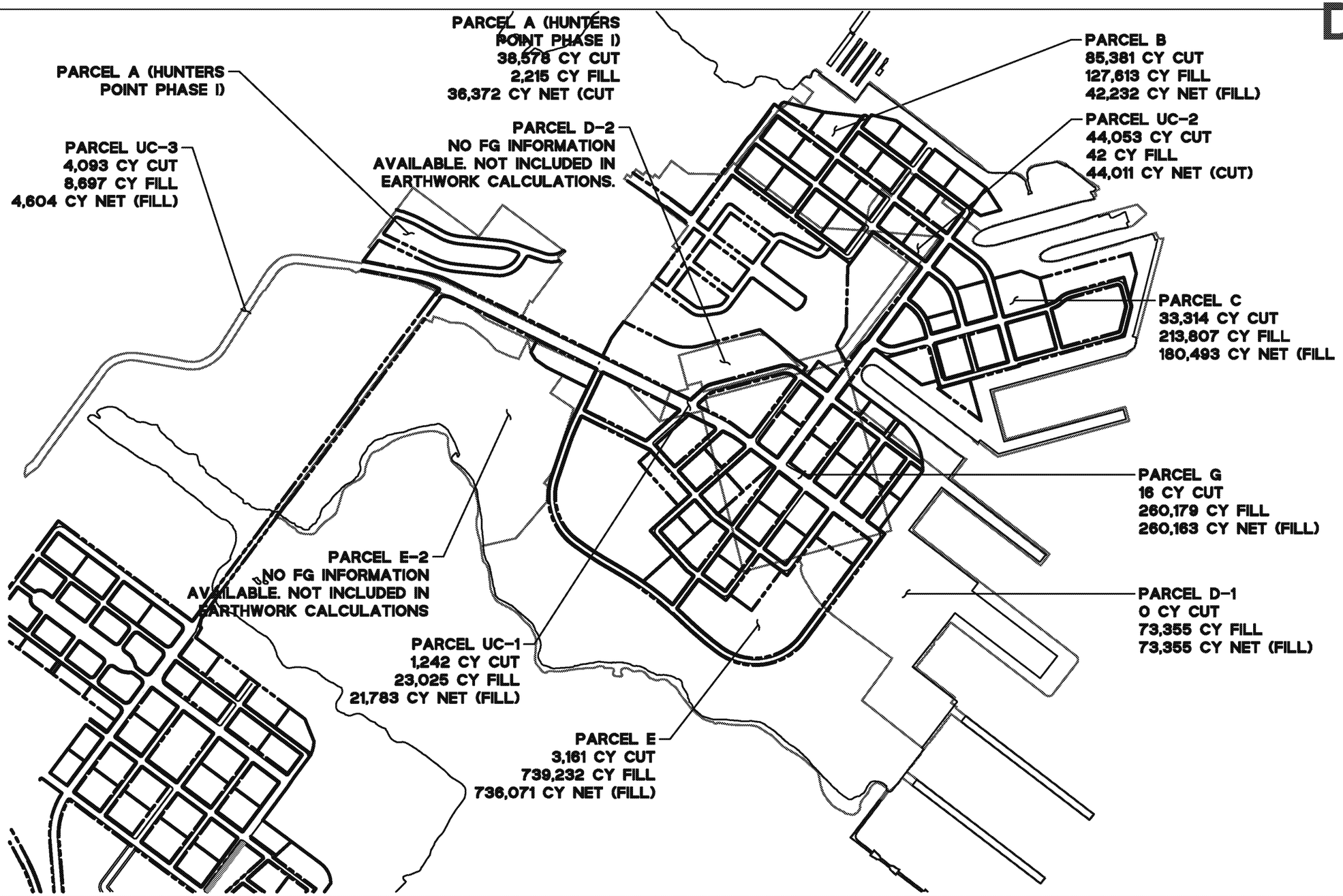
Geosyntec consultants

WR1247A	August 2014

Figure 1

P:\GIS\Lennar\HuntersPoint\Project\2014May\Fig01_SiteLayout_0514.mxd

DRAFT



Legend

N

0 600 Feet

Estimated Cut and Fill Volumes

Soil Import Plan
Hunters Point, Shipyard, San Francisco, CA

Geosyntec consultants

WR1247A | August 2014

Figure 2

P:\GIS\Lennar\HuntersPoint\ai\2014May\Fig02_Est.CutFillVol.ai

ED_006787_00016724-00139

APPENDIX A
Information Advisory
Clean Imported Fill Material,
Department of Toxic Substances Control
(DTSC, 2001)

Information Advisory
Clean Imported Fill Material

October 2001

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

It is DTSC's mission to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality, by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.

State of California

California Environmental Protection Agency

Executive Summary

This fact sheet has been prepared to ensure that inappropriate fill material is not introduced onto sensitive land use properties under the oversight of the DTSC or applicable regulatory authorities. Sensitive land use properties include those that contain facilities such as hospitals, homes, day care centers, and schools. This document only focuses on human health concerns and ecological issues are not addressed. It identifies those types of land use activities that may be appropriate when determining whether a site may be used as a fill material source area. It also provides guidelines for the appropriate types of analyses that should be performed relative to the former land use, and for the number of samples that should be collected and analyzed based on the estimated volume of fill material that will need to be used. The information provided in this fact sheet is not regulatory in nature, rather is to be used as a guide, and in most situations the final decision as to the acceptability of fill material for a sensitive land use property is made on a case-by-case basis by the appropriate regulatory agency.

Introduction

The use of imported fill material has recently come under scrutiny because of the instances where contaminated soil has been brought onto an otherwise clean site. However, there are currently no established standards in the statutes or regulations that address environmental requirements for imported fill material. Therefore, the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) has prepared this fact sheet to identify procedures that can be used to minimize the possibility of introducing contaminated soil onto a site that requires imported fill material. Such sites include those that are undergoing site remediation, corrective action, and closure activities overseen by DTSC or the appropriate regulatory agency. These procedures may also apply to construction projects that will result in sensitive land uses. The intent of this fact sheet is to protect people who live on or otherwise use a sensitive land use property. By using this fact sheet as a guide, the reader will minimize the chance of introducing fill material that may result in potential risk to human health or the environment at some future time.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.dtsc.ca.gov.

Overview

Both natural and manmade fill materials are used for a variety of purposes. Fill material properties are commonly controlled to meet the necessary site specific engineering specifications. Because most sites requiring fill material are located in or near urban areas, the fill materials are often obtained from construction projects that generate an excess of soil, and from demolition debris (asphalt, broken concrete, etc.). However, materials from those types of sites may or may not be appropriate, depending on the proposed use of the fill, and the quality of the assessment and/or mitigation measures, if necessary. Therefore, unless material from construction projects can be demonstrated to be free of contamination and/or appropriate for the proposed use, the use of that material as fill should be avoided.

Selecting Fill Material

In general, the fill source area should be located in nonindustrial areas, and not from sites undergoing an environmental cleanup. Nonindustrial sites include those that were previously undeveloped, or used solely for residential or agricultural purposes. If the source is from an agricultural area, care should be taken to insure that the fill does not include former agricultural waste process byproducts such as manure or other decomposed organic material. Undesirable sources of fill material include industrial and/or commercial sites where hazardous ma-

Potential Contaminants Based on the Fill Source Area

Fill Source:	Target Compounds
Land near to an existing freeway	Lead (EPA methods 6010B or 7471A), PAHs (EPA method 8310)
Land near a mining area or rock quarry	Heavy Metals (EPA methods 6010B and 7471A), asbestos (polarized light microscopy), pH
Agricultural land	Pesticides (Organochlorine Pesticides: EPA method 8081A or 8080A; Organophosphorus Pesticides: EPA method 8141A; Chlorinated Herbicides: EPA method 8151A), heavy metals (EPA methods 6010B and 7471A)
Residential/acceptable commercial land	VOCs (EPA method 8021 or 8260B, as appropriate and combined with collection by EPA Method 5035), semi-VOCs (EPA method 8270C), TPH (modified EPA method 8015), PCBs (EPA method 8082 or 8080A), heavy metals including lead (EPA methods 6010B and 7471A), asbestos (OSHA Method ID-191)

**The recommended analyses should be performed in accordance with USEPA SW-846 methods (1996). Other possible analyses include Hexavalent Chromium: EPA method 7199*

Recommended Fill Material Sampling Schedule

Area of Individual Borrow Area	Sampling Requirements
2 acres or less	Minimum of 4 samples
2 to 4 acres	Minimum of 1 sample every 1/2 acre
4 to 10 acres	Minimum of 8 samples
Greater than 10 acres	Minimum of 8 locations with 4 subsamples per location
Volume of Borrow Area Stockpile	**Samples per Volume**
Up to 1,000 cubic yards	1 sample per 250 cubic yards
1,000 to 5,000 cubic yards	4 samples for first 1000 cubic yards +1 sample per each additional 500 cubic yards
Greater than 5,000 cubic yards	12 samples for first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

terials were used, handled or stored as part of the business operations, or unpaved parking areas where petroleum hydrocarbons could have been spilled or leaked into the soil. Undesirable commercial sites include former gasoline service stations, retail strip malls that contained dry cleaners or photographic processing facilities, paint stores, auto repair and/or painting facilities. Undesirable industrial facilities include metal processing shops, manufacturing facilities, aerospace facilities, oil refineries, waste treatment plants, etc. Alternatives to using fill from construction sites include the use of fill material obtained from a commercial supplier of fill material or from soil pits in rural or suburban areas. However, care should be taken to ensure that those materials are also uncontaminated.

Documentation and Analysis

In order to minimize the potential of introducing contaminated fill material onto a site, it is necessary to verify through documentation that the fill source is appropriate and/or to have the fill material analyzed for potential contaminants based on the location and history of the source area. Fill documentation should include detailed information on the previous use of the land from where the fill is taken, whether an environmental site assessment was performed and its findings, and the results of any testing performed. It is recommended that any such documentation should be signed by an appropriately licensed (CA-registered) individual. If such documentation is not available or is inadequate, samples of the fill material should be chemically analyzed. Analysis of the fill material should be based on the source of the fill and knowledge of the prior land use.

Detectable amounts of compounds of concern within the fill material should be evaluated for risk in accordance with the DTSC Preliminary Endangerment Assessment (PEA) Guidance Manual. If

metal analyses are performed, only those metals (CAM 17 / Title 22) to which risk levels have been assigned need to be evaluated. At present, the DTSC is working to establish California Screening Levels (CSL) to determine whether some compounds of concern pose a risk. Until such time as these CSL values are established, DTSC recommends that the DTSC PEA Guidance Manual or an equivalent process be referenced. This guidance may include the Regional Water Quality Control Board's (RWQCB) guidelines for reuse of non-hazardous petroleum hydrocarbon contaminated soil as applied to Total Petroleum Hydrocarbons (TPH) only. The RWQCB guidelines should not be used for volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCS). In addition, a standard laboratory data package, including a summary of the QA/QC (Quality Assurance/Quality Control) sample results should also accompany all analytical reports.

When possible, representative samples should be collected at the borrow area while the potential fill material is still in place, and analyzed prior to removal from the borrow area. In addition to performing the appropriate analyses of the fill material, an appropriate number of samples should also be determined based on the approximate volume or area of soil to be used as fill material. The table above can be used as a guide to determine the number of samples needed to adequately characterize the fill material when sampled at the borrow site.

Alternative Sampling

A Phase I or PEA may be conducted prior to sampling to determine whether the borrow area may have been impacted by previous activities on the property. After the property has been evaluated, any sampling that may be required can be determined during a meeting with DTSC or appropriate regulatory agency. However, if it is not possible to analyze the fill material at the borrow area or determine that it is appropriate for use via a Phase I or PEA, it is recommended that one (1) sample per truckload be collected and analyzed for all compounds of concern to ensure that the imported soil is uncontaminated and acceptable. (See chart on Potential Contaminants Based on the Fill Source Area for appropriate analyses). This sampling frequency may be modified upon consultation with the DTSC or appropriate regulatory agency if all of the fill material is derived from a common borrow area. However, fill material that is not characterized at the borrow area will need to be stockpiled either on or off-site until the analyses have been completed. In addition, should contaminants exceeding acceptance criteria be identified in the stockpiled fill material, that material will be deemed unacceptable and new fill material will need to be obtained, sampled and analyzed. Therefore, the DTSC recommends that all sampling and analyses should be completed prior to delivery to the site to ensure the soil is free of contamination, and to eliminate unnecessary transportation charges for unacceptable fill material.

Composite sampling for fill material characterization may or may not be appropriate, depending on quality and homogeneity of source/borrow area, and compounds of concern. Compositing samples for volatile and semivolatile constituents is not acceptable. Composite sampling for heavy metals, pesticides, herbicides or PAH's from unanalyzed stockpiled soil is also unacceptable, unless it is stockpiled at the borrow area and originates from the same source area. In addition, if samples are composited, they should be from the same soil layer, and not from different soil layers.

When very large volumes of fill material are anticipated, or when larger areas are being considered as borrow areas, the DTSC recommends that a Phase I or PEA be conducted on the area to ensure that the borrow area has not been impacted by previous activities on the property. After the property has been evaluated, any sampling that may be required can be determined during a meeting with the DTSC.

For further information, call Richard Coffman, Ph.D., R.G., at (818) 551-2175.

APPENDIX B
Backfill Review and Acceptance Form

Geosyntec consultants

BACKFILL REVIEW AND ACCEPTANCE FORM

Contract No.	Project No.	Form No. BACKFILL -

Preparer:	Date:
Planned Backfill Usage:	
Source of Material:	

Sample I.D.:			
Sample I.D.:			

ATTACHMENTS

	Attached	Not Applicable	Specify
SAP Section/Tables for Analytical:	☐	☐	
SAP Section/Tables for Radiological:	☐	☐	
Chemistry Data:	☐	☐	
Radiological Data (onsite):	☐	☐	
Radiological Data (offsite):	☐	☐	
Other:	☐	☐	

CHEMISTRY DATA EVALUATION

Class 1	Class 2	Class 3
Analytes are below established criteria AND Analytes without established standards are not detected ☐	Analytes are below established criteria AND Metal analytes are below HPAL AND Detected analytes without established criteria are deemed "acceptable" by the Regulatory Specialist ☐	One or more non-metal analytes exceeds established criteria OR One or more metal analytes exceeds HPAL OR Detected analytes without established criteria are deemed "acceptable" by the Regulatory Specialist ☐

Explanation for Class 2 or 3: (Attach additional sheet if necessary)

Chemist Signature	Date

Geosyntec consultants

BACKFILL REVIEW AND ACCEPTANCE FORM (Cont.)

Contract No.	Project No.	Form No. BACKFILL -

RADIOLOGICAL DATA EVALUATION

Class 1	Class 3	Radiological Safety Officer (Signature)	Date
Results are below established standards ☐	One or more results exceeded established standards ☐		

Explanation for Class 3 (Attach additional sheet if necessary)

REVIEW

Regulatory Specialist (Signature)	Explanation	Date
Project QC Manager (Signature)	Explanation (if any)	Date

APPROVAL

Project Manager (Signature)	Date	Lennar Representative (Signature)	Date

ACKNOWLEDGEMENT

Construction Manager (Signature)	Date

APPENDIX E

Vapor Intrusion Assessment

APPENDIX E
VAPOR INTRUSION ASSESSMENT - GROUNDWATER

1. INTRODUCTION

This Appendix presents the results of the groundwater vapor intrusion pathway analysis for a hypothetical future commercial/industrial worker as part of the redevelopment project for the Artist building located at the corner of Horne and Robinson Street in San Francisco, California (the Site). The proposed building will be located within Parcel UC-2 and the former Hunters Point Naval Shipyard in the vicinity of groundwater monitoring wells IR06MW54F, -55F, and 56F.

Residual volatile organic chemicals (VOCs) remain in groundwater. Due to the presence of VOCs in the subsurface, there is a potential for these chemicals to migrate from the subsurface into indoor air of future enclosed structures at the Site. The potential migration to indoor air was evaluated using the Johnson and Ettinger (J&E) subsurface vapor intrusion model (Johnson and Ettinger, 1991 and DTSC, 2011). The J&E model accounts for the diffusion of chemicals through the subsurface, the advection of chemicals through soil and concrete slabs due to air pressure differentials between soil and overlying buildings, and the mixing of soil vapor and indoor air caused by the building's heating, ventilation, and air conditioning systems.

The J&E vapor intrusion model may be applied using soil gas or groundwater concentration data. For chemicals that are detected in more than one media, the potential exists for over-representing the flux to indoor air. In other words, chemicals volatilizing from soil and groundwater may contribute to the shallow soil gas volatilization potential. Soil gas data are typically the preferred medium from which to evaluate the vapor intrusion pathway due to the uncertainty in modeling VOC partitioning from soil or groundwater into soil gas (DTSC, 2011). However, separate evaluations may be conducted on the chemicals detected in various media to determine the potential contribution the media may have on the vapor intrusion pathway.

The vapor intrusion evaluation presented herein is based on groundwater data.

1.1 Data Evaluation

Groundwater monitoring has been conducted at the Site over a period of years. The most current groundwater data set within the last five years was considered as these data best represents current and future conditions underlying the Site. The two chemicals consistently detected in groundwater monitoring wells IR06MW54F, 55F, and 56F are carbon tetrachloride and chloroform. Carbon tetrachloride and chloroform were detected at maximum concentrations of 9 and 2.5 micrograms per liter (µg/L). These constituents are considered chemicals of potential concern (COPC) for vapor intrusion and the maximum concentrations were used as inputs to the model.

1.2 Human Health Indoor Air Screening Criteria

Indoor air screening levels are based on the USEPA Regional Screening Levels (RSLs) for worker air (USEPA, 2014), including the California-modified indoor air screening levels published by the Department of Toxic Substances Control (DTSC, 2014). The worker air screening levels for an 8-hour work day exposure for carbon tetrachloride and chloroform in units of micrograms per cubic meter ($\mu g/m^3$) are presented below.

8-Hour Worker Indoor Air Screening Level	Carbon Tetrachloride	Chloroform
	$\mu g/m^3$	$\mu g/m^3$
Cancer	0.29	2.3
Noncancer	180	1300

1.3 Estimating Indoor Air Concentrations

The J&E modeling was conducted for a future commercial building based on three different scenarios: 1) a baseline condition assuming no changes to the elevation, that is, a future building is constructed on existing grade; 2) a change in elevation where approximately 19.5 feet of overlying fill will be removed as part of Site redevelopment; and 3) a change in elevation and assuming groundwater is directly beneath the foundation of a future building.

Groundwater was not encountered based on information presented on borings logs for groundwater monitoring wells IR06MW54F, 55F, and 56F. As such, depth to first groundwater used for this evaluation corresponds to the top of the shallowest well screen (33.5 feet bgs) from the three existing monitoring wells (PRC, 1993).

Inputs to the J&E model include groundwater concentrations, chemical properties, unsaturated zone soil properties, depth to groundwater, building parameters, and ventilation rates. The predicted attenuation factors from the model are used to estimate indoor air concentrations from groundwater. When available, site-specific information was used as inputs to the model. For example, building-specific design information, such as the slab thickness (i.e., 5-inch reinforced concrete slab) overlying 12 inches of engineered fill, building dimensions (approximately 107.25 feet by 121.25 feet), and the height of the first floor (14 feet) were used. In the absence of site-specific information, USEPA-recommended default input parameters were used, including a default indoor air exchange rate of 1 air exchange per hour for commercial/industrial buildings and a proportionally adjusted Qsoil value of 5 liters per minute (l/min) per 100 m^2 of floor space to represent the flow rate of chemicals from directly below the building foundation into indoor air.

A summary of the modeling inputs is presented in Table 1 for the three different scenarios. In each case, default soil physical parameters (e.g., soil bulk density and total soil porosity) for soil type sand (S) and silty clay (SC) were used to represent the slab and the underlying engineered fill, respectively.

Soil properties below engineered fill under baseline conditions (scenario number 1) were based on a soil sample collected from a depth of 5 feet below ground surface (bgs), as reported in the Navy's March *2013 Final Technical Memorandum – Soil Vapor Investigation in Support of Vapor Intrusion Assessment, Parcels B, D-1, G, and UC-2*. Soil at this depth interval was classified as "fine sand" and the measured soil properties were used to represent vadose zone soil. For scenarios 2 and 3, default values for a soil type sand (S) were used.

The J&E model spreadsheets, including the model inputs, intermediate calculations, and predicted indoor air concentrations, are presented in Attachment A. The predicted indoor air concentrations from the model are presented below and are used in the estimation of potential risk and hazard.

Predicted Indoor Air Concentration	Carbon Tetrachloride	Chloroform
	µg/m^3	µg/m^3
Scenario 1 - Baseline	0.0941	0.00426
Scenario 1 - New Elevation	0.65	0.0285
Scenario 1 - New Elevation - groundwater below slab	0.918	0.0396

1.4 Human Health Risk Characterization

This risk characterization step estimates the degree of COPC exposure and the possible adverse health effects associated with such exposure. Cancer risks and noncancer hazard indexes (HIs) were calculated according to regulatory guidance for a future worker. To characterize noncarcinogenic health hazards, noncancer HI are compared to U.S. EPA's and Cal/EPA's acceptable HI of 1. To characterize carcinogenic health risks, the results are compared to U.S. EPA's acceptable risk range of 1×10^{-6} to 1×10^{-4}, with Cal/EPA's 1×10^{-6} (one in one million) as the *de minimis* risk level and the point of departure for making risk management decisions.

Theoretical excess lifetime cancer risks were calculated by dividing the predicted indoor air concentration by the indoor air , cancer-based, risk-based screening level and then multiplying by the target risk level of one-in-one million or 1×10^{-6}. Similarly, for non-cancer health effects, hazard quotients (HQs) were calculated by dividing the predicted indoor air concentration by the indoor air, non-cancer-based risk-based screening level and multiplying by the target HQ of 1.0 Cumulative effects from exposure to multiple chemicals were conservatively evaluated by summing the estimated chemical-specific cancer risks or HQs.

The estimated theoretical excess lifetime cancer risk estimates and non-carcinogenic hazard estimates for the three scenarios are summarized below.

Theoretical Excess Lifetime Cancer Risk	Carbon Tetrachloride	Chloroform	TOTAL
Scenario 1 - Baseline	3.2E-07	1.9E-09	3E-07
Scenario 2 - New Elevation	2.2E-06	1.2E-08	2E-06
Scenario 3 - New Elevation - groundwater below slab	3.2E-06	1.7E-08	3E-06

Hazard Index	Carbon Tetrachloride	Chloroform	TOTAL
Scenario 1 - Baseline	0.0005	3.3E-06	0.0005
Scenario 2 - New Elevation	0.0036	2.2E-05	0.004
Scenario 3 - New Elevation - groundwater below slab	0.0051	3.0E-05	0.005

- Under baseline conditions for a future on-site worker, the theoretical excess lifetime cancer risk from vapor intrusion based on groundwater is 3×10^{-7}. The hazard index is 0.0005.

- Under a new elevation scenario, the theoretical excess lifetime cancer risk from vapor intrusion based on groundwater is 2×10^{-6}. The hazard index is 0.004.

- Under a new elevation assuming groundwater is directly below the building foundation scenario, the theoretical excess lifetime cancer risk from vapor intrusion based on groundwater is 3×10^{-6}. The hazard index is 0.005.

1.5 Summary

Using maximum groundwater COPC concentrations detected at the Site within the last five years, the total cancer risks from inhalation exposure to vapors emanating from groundwater into indoor air range from 3×10^{-7} to 3×10^{-6} and are below and within the

risk management range of 1×10^{-4} to 1×10^{-6}. The total noncancer hazard indexes are all below the benchmark level of 1.

The purpose of a HHRA is not to predict the actual risk of exposure to an individual. Rather, risk assessments are a management tool for developing conservative estimates of health hazards, which are unlikely to underestimate the true risk for potentially exposed populations. As a result, the numerical estimates in a risk assessment (risk values) have associated uncertainties reflecting the limitations in available knowledge about Site concentrations, exposure assumptions (e.g., chronic exposure concentrations, intake rates, frequency of time spent at home), and chemical toxicity. Where necessary, conservative (erring on being over-protective) assumptions are made.

TABLE 1
JOHNSON AND ETTINGER MODEL INPUT PARAMETERS
Parcel UC-2 – Vapor Intrusion from Groundwater
San Francisco, California

Parameter	Symbol	Units	Baseline	New Elevation	New Elevation Shallow GW	Rationale
Depth below grade to bottom of enclosed floor space	L_F	(cm)	12.7	12.7	12.7	site-specific 5-inch reinforced concrete slab per structural foundation plan S2.1
Depth below grade to water table	L_{wt}	(cm-bgs)/ (ft-bgs)	1,021/33.5	426.72/14	47.1/1.5	Well 56F boring log; based on proposed storm drain; and assumed directly beneath foundation and capillary fringe
Average soil/groundwater temperature	Ts	(^oC)	15	15	15	Figure 8, EPA, 2004
Soil type – Stratum A	–	–	S	S	S	Default for slab
Thickness of Soil Stratum A	h_A	(cm)	30.5	30.5	30.5	site-specific Soil Report page 16
Soil dry bulk density – Stratum A	ρ_b	(g/cm^3)	1.66	1.66	1.66	Defaults for sand
Soil total porosity – Stratum A	P_T	(cm^3/cm^3)	0.375	0.375	0.375	
Soil water-filled porosity – Stratum A	P_w	(cm^3/cm^3)	0.054	0.054	0.054	
Soil type – Stratum B	–	–	SIC	SIC	SIC	Engineered fill
Thickness of Soil Stratum B	h_B	(cm)	30.5	30.5	30.5	Soils report, page 16 1 ft non-expansive engineered fill
Soil dry bulk density – Stratum B	ρ_b	(g/cm^3)	1.8	1.8	1.8	Defaults for engineered fill – OEHHA 2005
Soil total porosity – Stratum B	P_T	(cm^3/cm^3)	0.3	0.3	0.3	
Soil water-filled porosity – Stratum B	P_w	(cm^3/cm^3)	0.15	0.15	0.15	
Soil type – Stratum C	–	–	S	S	S	IR06MW56F-5.0 soil sample (Navy Final Tech Memorandum); site-specific values and defaults for sand
Thickness of Soil Stratum C	h_C	(cm)/(ft)	960.1	365.7	17.05	
Soil dry bulk density – Stratum C	ρ_b	(g/cm^3)	1.73	1.66	1.66	
Soil total porosity – Stratum C	P_T	(cm^3/cm^3)	0.367	0.375	0.375	
Soil water-filled porosity – Stratum C	P_w	(cm^3/cm^3)	0.195	0.054	0.054	
Enclosed Space Floor Thickness	L_{crack}	(cm)/(ft)	12.7	12.7	12.7	site-specific 5-inch reinforced concrete slab
Soil/Building pressure differential	ΔP	($g/cm\text{-}s^2$)	40	40	40	Default
Height of building (1^{st} floor)	H_B	(cm)/(ft)	427.6/14	427.6/14	427.6/14	Site-specific dimensions
Width of building	W_B	(cm)/(ft)	3,269/107	3,269/107	3,269/107	
Length of building	W_B	(cm)/(ft)	3,696/121	3,696/121	3,696/121	
Crack-to-total area ratio	η	(unitless)	0.005	0.005	0.005	Default DTSC VIG
Indoor air exchange rate	ER	(1/hr)	1	1	1	Default commercial building
Average Vapor Flow Rate	Q_{soil}	(L/min)	107.3	107.3	107.3	Ratio of new building dimensions to default 5 L/min, DTSC VIG

Attachments

DATA ENTRY SHEET

GW-ADV Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES X

Geosyntec
modified by RHC; 10/11
Mult. Chemical; version 3.1.3

ENTER U.S. EPA or Cal-EPA: Cal-EPA

MORE

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
56235	9.00E+00	Carbon tetrachloride
67663	2.50E+00	Chloroform

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Totals must add up to value of L_{WT} (cell G28): Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
15	12.7	1021.08	12.7	30.5	977.9	C	S	S		
	5	33.5			32.1					

MORE

ENTER Stratum A SCS soil type	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
Lookup Soil				Lookup Soil Parameters				Lookup Soil Parameters			
S	1.66	0.375	0.054	SIC	1.80	0.300	0.15	S	1.73	0.367	0.195
	model defaults				defailt for engineered fill (OEHHA)				measured data		

MORE

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm-s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
12.7	40	3268.98	3695.7	426.72	0.1	1	60.41
		107.25	121.25	14			

MORE

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	25	25	250	1.0E-06	1
				Used to calculate risk-based groundwater concentration.	

END

CHEMICAL PROPERTIES SHEET

	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
Carbon tetrachloride	7.80E-02	8.80E-06	3.03E-02	25	7,127	349.90	556.60	1.74E+02	7.93E+02	4.2E-05	4.0E-02
Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	3.98E+01	7.92E+03	5.3E-06	3.0E-01

END

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
7.88E+08	1008.38	0.321	0.150	0.172	0.003	1.00E-07	0.998	9.99E-08	17.05	0.367	0.114	0.253	13,929
7.88E+08	1008.38	0.321	0.150	0.172	0.003	1.00E-07	0.998	9.99E-08	17.05	0.367	0.114	0.253	13,929

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.43E+06	1.21E+07	5.00E-03	12.7	7,808	1.92E-02	8.12E-01	1.77E-04	1.26E-02	1.56E-03	1.65E-03	4.17E-04	1.57E-03	1008.38
1.43E+06	1.21E+07	5.00E-03	12.7	7,502	2.36E-03	9.98E-02	1.77E-04	1.68E-02	2.09E-03	2.20E-03	5.62E-04	2.09E-03	1008.38

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
12.7	7.31E+03	4.34	1.01E+03	1.26E-02	6.04E+04	1.95E+07	1.29E-05	9.41E-02	4.2E-05	4.0E-02
12.7	2.49E+02	4.34	1.01E+03	1.68E-02	6.04E+04	2.94E+05	1.71E-05	4.26E-03	5.3E-06	3.0E-01

END

DATA ENTRY SHEET

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES X

Geosyntec
modified by RHC; 10/11
Mult. Chemical; version 3.1.3

ENTER
U.S. EPA or
Cal-EPA

Cal-EPA

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
56235	9.00E+00	Carbon tetrachloride
67663	2.50E+00	Chloroform

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Totals must add up to value of L_{WT} (cell G28) Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
15	12.7	426.72	12.7	30.5	383.52	C	S	S		
	5	14 see notes								

MORE ↓

ENTER Stratum A SCS soil type	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
Lookup Soil				Lookup Soil Parameters				Lookup Soil Parameters			
S	1.66	0.375	0.054	SIC	1.80	0.300	0.15	S	1.66	0.375	0.054
	model defaults for sand				default for engineered fill (OEHHA)						

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
12.7	40	3268.98	3695.7	427.56	0.1	1	60.41
		107.25	121.25	14			

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	25	25	250	1.0E-06	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
7.88E+08	414.02	0.321	0.150	0.321	0.003	1.00E-07	0.998	9.99E-08	17.05	0.375	0.122	0.253	13,929
7.88E+08	414.02	0.321	0.150	0.321	0.003	1.00E-07	0.998	9.99E-08	17.05	0.375	0.122	0.253	13,929

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.43E+06	1.21E+07	5.00E-03	12.7	7,808	1.92E-02	8.12E-01	1.77E-04	1.26E-02	1.56E-03	1.26E-02	5.00E-04	5.01E-03	414.02
1.43E+06	1.21E+07	5.00E-03	12.7	7,502	2.36E-03	9.98E-02	1.77E-04	1.68E-02	2.09E-03	1.68E-02	6.73E-04	6.71E-03	414.02

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
12.7	7.31E+03	4.34	1.01E+03	1.26E-02	6.04E+04	1.95E+07	8.90E-05	6.50E-01	4.2E-05	4.0E-02
12.7	2.49E+02	4.34	1.01E+03	1.68E-02	6.04E+04	2.94E+05	1.14E-04	2.85E-02	5.3E-06	3.0E-01

END

GW-ADV
Version 3.1; 02/04

Reset to

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES X

Geosyntec
modified by RHC; 10/11
Mult. Chemical; version 3.1.3

ENTER U.S. EPA or Cal-EPA: Cal-EPA

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
56235	9.00E+00	Carbon tetrachloride
67663	2.50E+00	Chloroform

MORE

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
15	12.7	78.047088	12.7	30.5	34.85	C	S	S		
	5	2.6								

MORE

ENTER Stratum A SCS soil type	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
Lookup Soil				Lookup Soil Parameters				Lookup Soil Parameters			
S	1.66	0.375	0.054	SIC	1.80	0.300	0.15	S	1.66	0.375	0.054
	model defaults for sand				default for engineered fill (OEHHA)						

MORE

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s^2)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
12.7	40	3268.98	3695.7	427.56	0.1	1	60.41
		107.25	121.25	14			

MORE

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	25	25	250	1.0E-06	1
				Used to calculate risk-based groundwater concentration.	

END

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
7.88E+08	65.347088	0.321	0.150	0.321	0.003	1.00E-07	0.998	9.99E-08	17.05	0.375	0.122	0.253	13,929
7.88E+08	65.347088	0.321	0.150	0.321	0.003	1.00E-07	0.998	9.99E-08	17.05	0.375	0.122	0.253	13,929

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.43E+06	1.21E+07	5.00E-03	12.7	7,808	1.92E-02	8.12E-01	1.77E-04	1.26E-02	1.56E-03	1.26E-02	5.00E-04	1.19E-03	65.347088
1.43E+06	1.21E+07	5.00E-03	12.7	7,502	2.36E-03	9.98E-02	1.77E-04	1.68E-02	2.09E-03	1.68E-02	6.73E-04	1.59E-03	65.347088

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
12.7	7.31E+03	4.34	1.01E+03	1.26E-02	6.04E+04	1.95E+07	1.26E-04	9.18E-01	4.2E-05	4.0E-02
12.7	2.49E+02	4.34	1.01E+03	1.68E-02	6.04E+04	2.94E+05	1.59E-04	3.96E-02	5.3E-06	3.0E-01

END

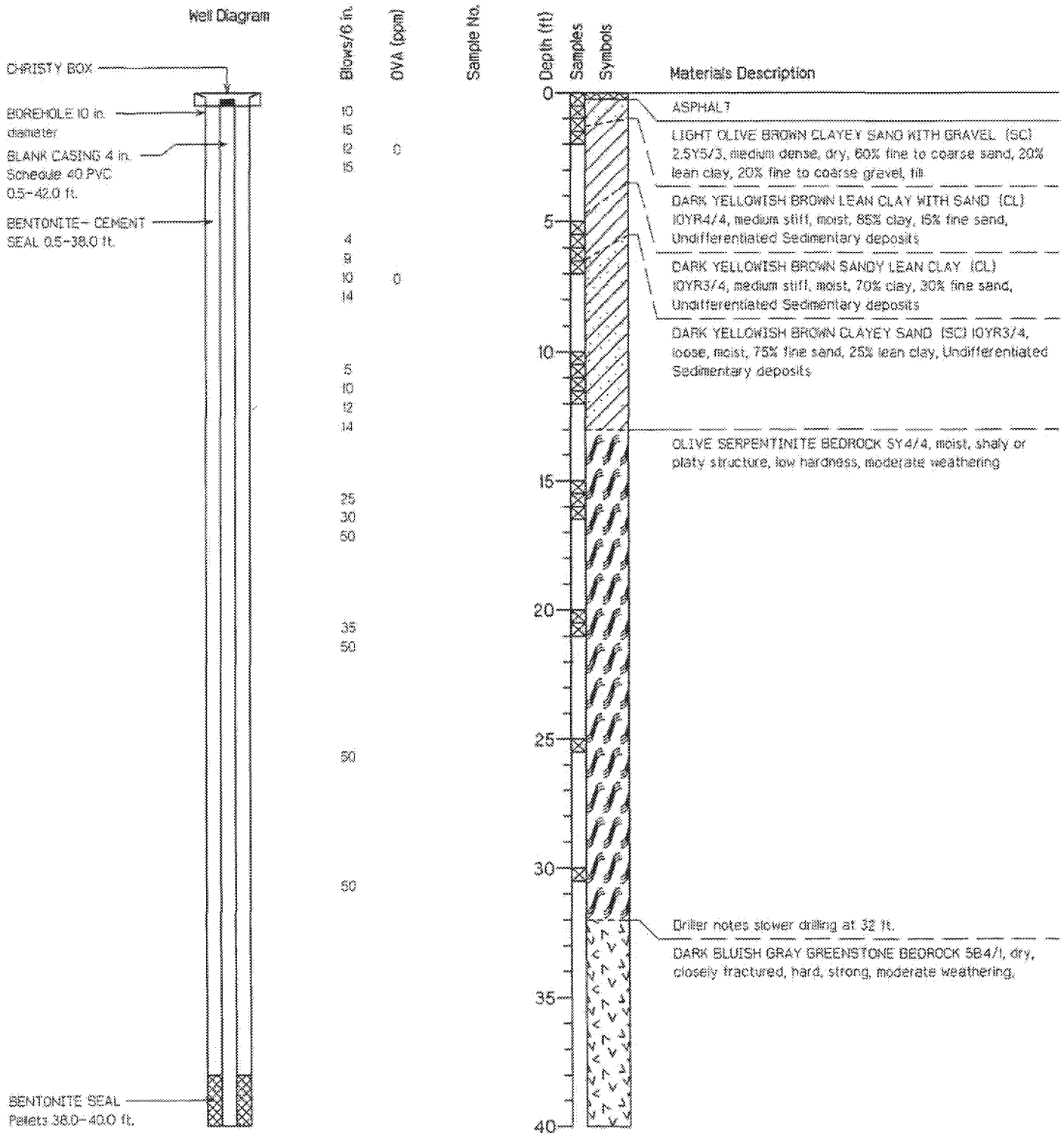
APPENDIX F

Groundwater Monitoring Well Construction Details

PRC Environmental Management, Inc.

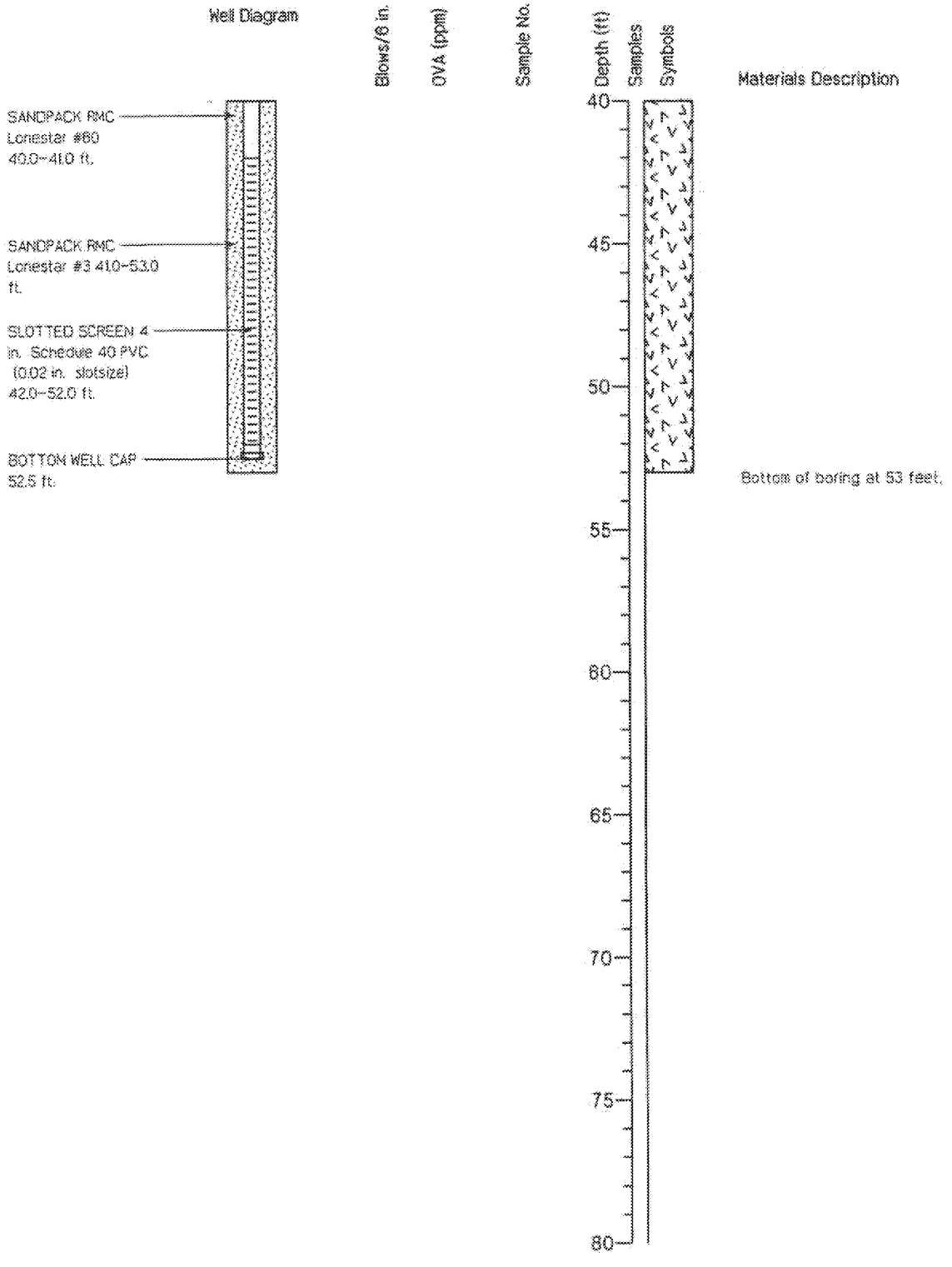
Adapted from Harding Lawson Associates

LOG OF BORING IR06MW54F



Project Number	11400.1402	Date Drilled	12/09/1993
Project Name	Parcel B RI Report	GS Elevation	35.86 ft.
Project Task	Hunters Point Annex	Water Level	None Encountered
Project Location	San Francisco, California	Total Depth Of Hole	53 ft.
Equipment	Drill Systems 1000 (ACH), 10 in. diam.		

Figure



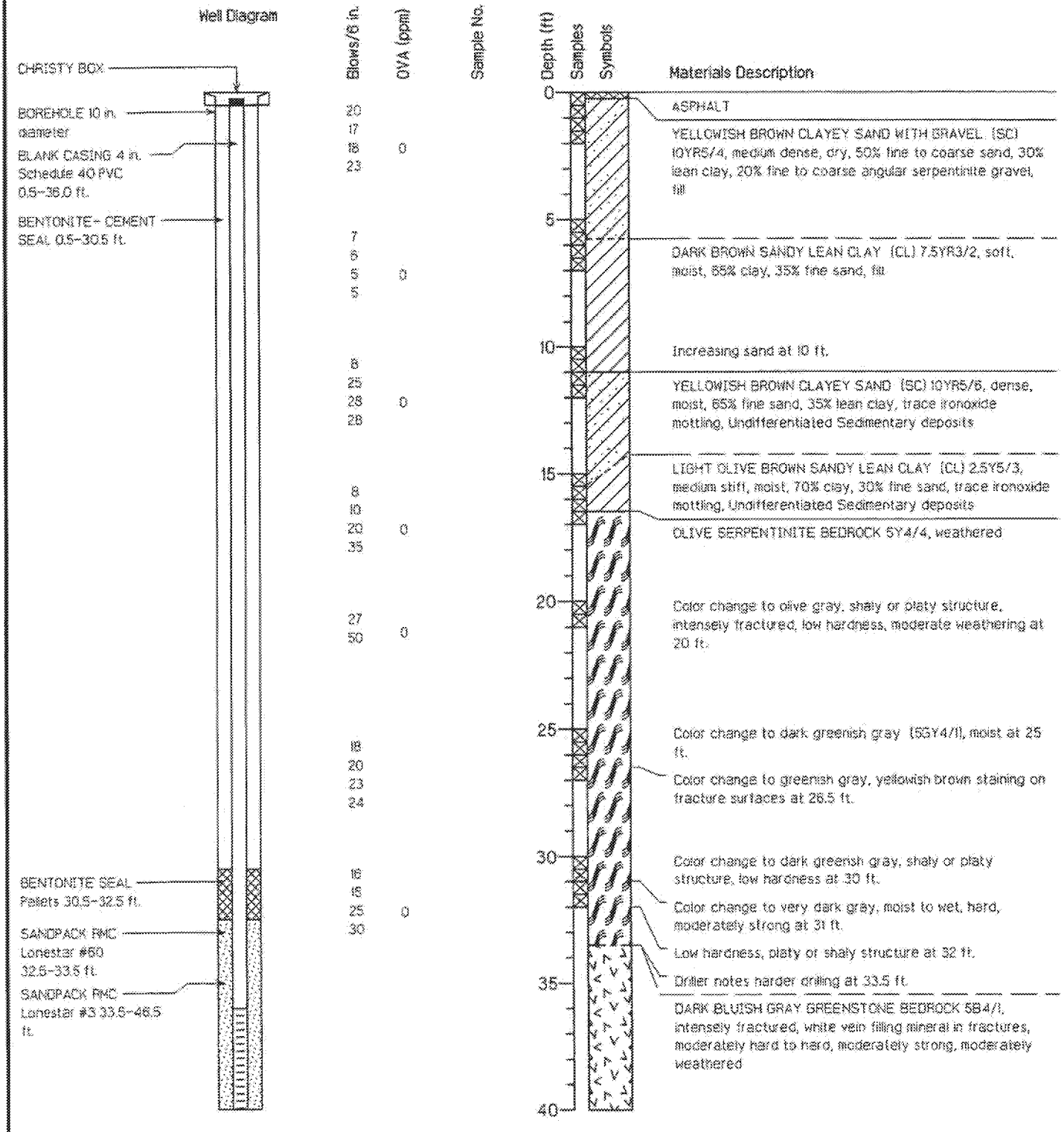
Project Number	11400.1402	Date Drilled	12/09/1993
Project Name	Parcel B RI Report	GS Elevation	35.66 ft.
Project Task	Hunters Point Annex	Water Level	None Encountered
Project Location	San Francisco, California	Total Depth Of Hole	53 ft.
Equipment	Drill Systems 1000 (ACH), 10 in. diam.		

Figure

PRC Environmental Management, Inc.

Adapted from Harding Lawson Associates

LOG OF BORING IR06MW55F



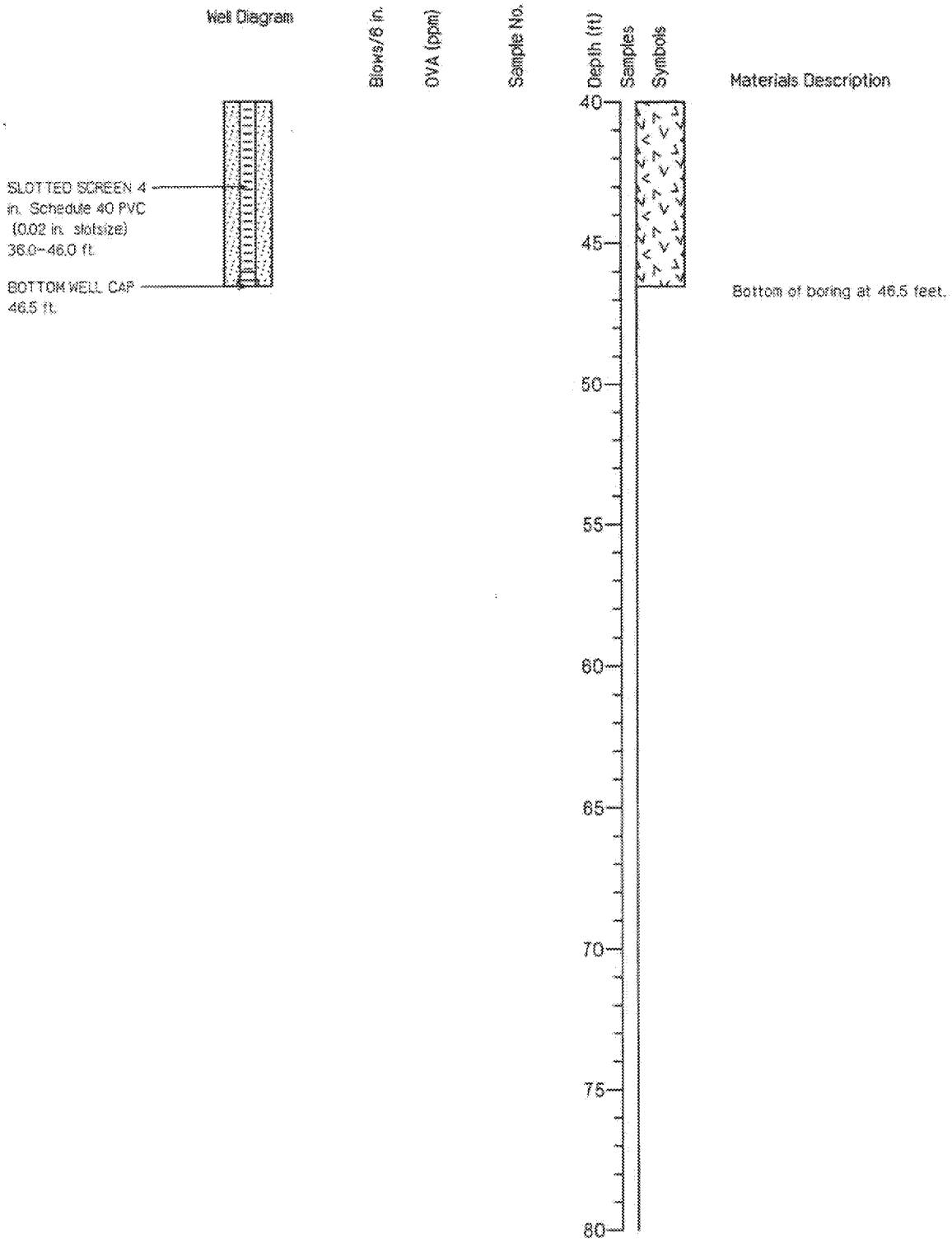
Project Number	11400.1402	Date Drilled	12/09/1993
Project Name	Parcel B RI Report	GS Elevation	32.94 ft.
Project Task	Hunters Point Annex	Water Level	None Encountered
Project Location	San Francisco, California	Total Depth Of Hole	46.5 ft.
Equipment	Drill Systems 1000 (ACH), 10 in. diam.		

Figure

PRC Environmental Management, Inc.

Adapted from Harding Lawson Associates

LOG OF BORING IR06MW55F



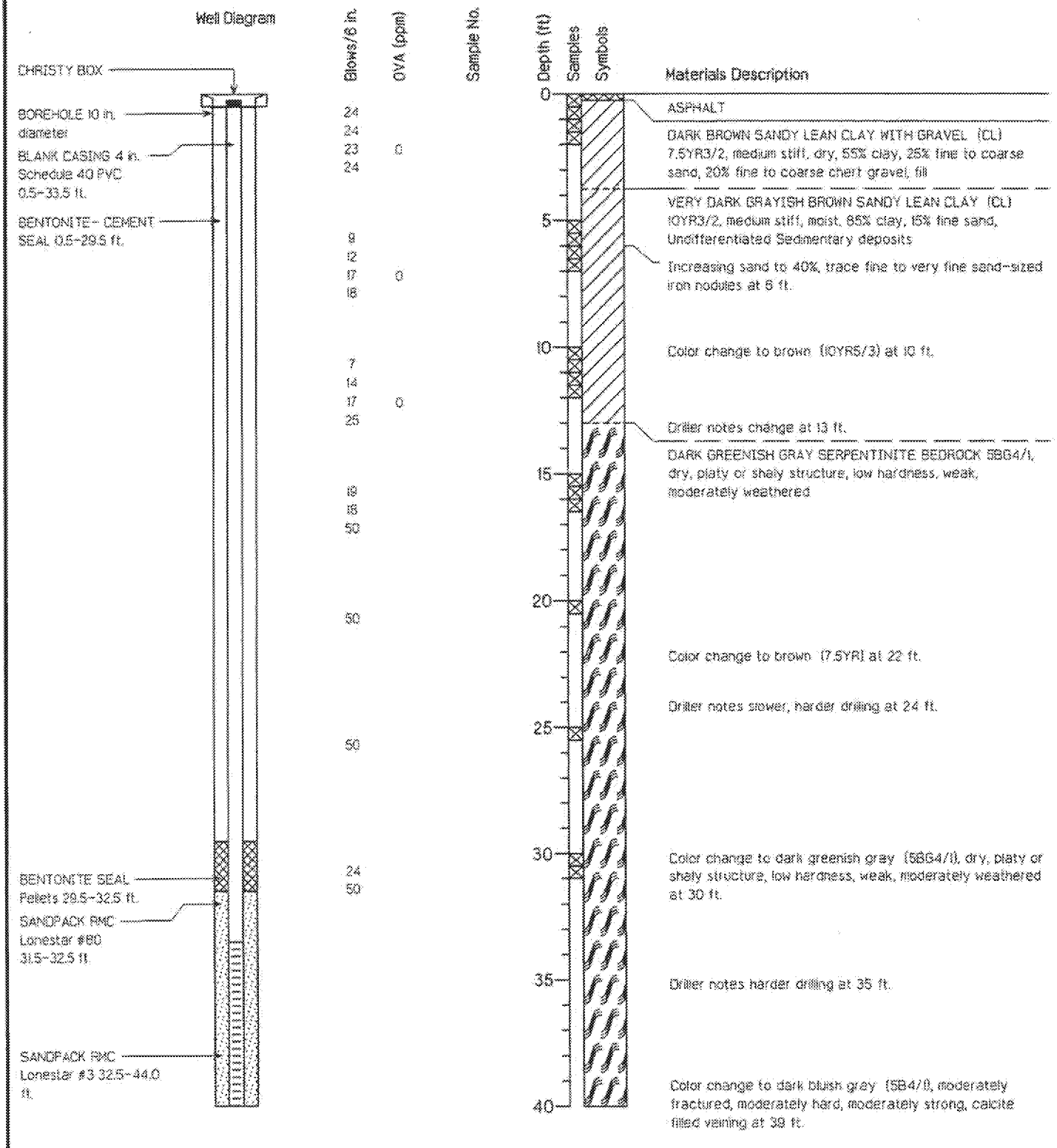
Project Number	11400.1402	Date Drilled	12/09/1993
Project Name	Parcel B RI Report	GS Elevation	32.94 ft.
Project Task	Hunters Point Annex	Water Level	None Encountered
Project Location	San Francisco, California	Total Depth Of Hole	46.5 ft.
Equipment	Drill Systems 1000 (ACH), 10 in. diam.		

Figure

PRC Environmental Management, Inc.

Adapted from Harding Lawson Associates

LOG OF BORING IR06MW56F



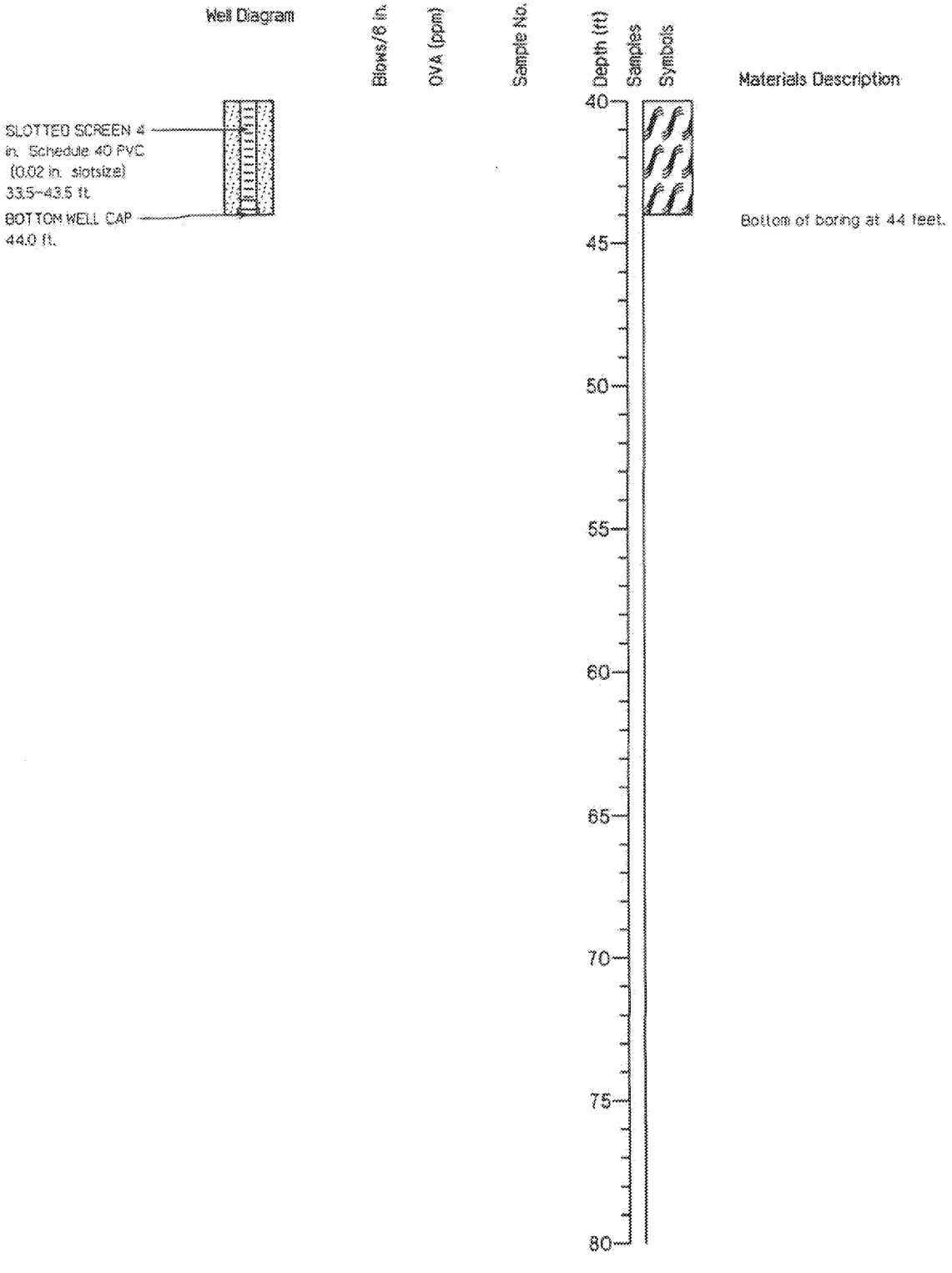
Project Number	11400.1402	Date Drilled	12/10/1993
Project Name	Parcel B RI Report	GS Elevation	28.03 ft.
Project Task	Hunters Point Annex	Water Level	None Encountered
Project Location	San Francisco, California	Total Depth Of Hole	44 ft.
Equipment	Drill Systems 1000 (ACH), 10 in. diam.		

Figure

PRC Environmental Management, Inc.

Adapted from Harding Lawson Associates

LOG OF BORING IR06MW56F



Project Number	11400.1402	Date Drilled	12/10/1993
Project Name	Parcel B RI Report	GS Elevation	26.03 ft.
Project Task	Hunters Point Annex	Water Level	None Encountered
Project Location	San Francisco, California	Total Depth Of Hole	44 ft.
Equipment	Drill Systems 1000 (ACH), 10 in. diam.		

Figure

Geosyntec consultants
1111 Broadway, 6th Fl
Oakland, CA 94607
Phone: (510) 836-3034
Fax: (510) 836-3036

GS FORM: WELL BORE GE

BOREHOLE LOG

BORING New proposed IR06MW54F **SHEET** 1 **OF** 1
START DATE **GROUND SURF.** 14.86 ft
FINISH DATE **TOP OF CASING** ft
LOCATION San Francisco, CA **DATUM**
PROJECT HPAP **WATER DEPTH:** 2.54 ft bgs
NUMBER **FIRST WATER:** n/a ft bgs

DESCRIPTION
1) Unit/Formation, Mem. 2) Soil/Rock Name 3) Color 4) Moisture 5) Grain Size 6) Percentage (gravel,sand,fines) 7) Plasticity 8) Density/Consistency 9) Structure 10) Other (Mineralization, Discoloration, Odor, etc.)

DEPTH (ft-bgs) | GRAPHIC LOG | WELL LOG | WELL COMPLETION DETAILS | ELEVATION (ft) | SAMPLE: SAMPLE NO. | TYPE | BLOWS PER 6" | RECOVERY (%) | PID READING (ppm) | TIME (00:00) | COMMENTS (1) Rig Behavior 2) Air Monitoring

0–10 ft: Serpentinite BEDROCK: Olive (5Y 4/4); moist; shaly or platy structure; low hardness; moderate weathering

10–32 ft: Greenstone BEDROCK: Dark bluish gray (5B 4/1); dry; closely fractured; hard; strong; moderate weathering

32 ft: BOREHOLE TERMINATED. Total depth = 32 ft bgs (originally 53ft bgs)

Flush mount well box
CASING: 4in. Schedule 40 PVC
Static water 2.54 ft bgs
GROUT: Bentonite-cement seal 0.5 - 17.0 ft
SEAL: Bentonite pellets 17.0 - 19.0 ft
TRANSITION SAND: Lonestar #60, 19.0 - 20.0 ft
FILTER PACK: Lonestar #3, 20.0 - 32.0 ft
SCREEN: 4" Schedule 40 PVC, 0.02in slots
Bottom well cap 31.5ft

ELEVATION (ft)	SAMPLE NO.	TYPE	BLOWS PER 6"	RECOVERY (%)	PID READING (ppm)	TIME (00:00)
11			50			
6			50			

COMMENTS: Driller notes slower drilling.

CONTRACTOR:
EQUIPMENT: Drill Systems 1000 (ACH)
DRILL MTHD:
HAMMER TYPE:
BOREHOLE DIAMETER: 10"
NORTHING:
EASTING:
COORDINATE SYSTEM:

LOGGER **REVIEWER**

NOTES: Original well installed at 35.86ft msl, total borehole depth 53ft bgs. Logging and well installation performed in 1993. Proposed excavation to 21ft below current ground surface. Water level (14.34 ft msl) measured in 1Q2014.

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

WELL_BORE_GE HUNTERS POINT.GPJ GEOSNTEC.GDT 1/26/15

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GS FORM: WELL BORE GE

BOREHOLE LOG

BORING New proposed IR06MW55F **SHEET** 1 OF 1
START DATE **GROUND SURF.** 32.94 ft
FINISH DATE **TOP OF CASING** ft
LOCATION San Francisco, CA **DATUM**
PROJECT HPAP **WATER DEPTH:** 3.27 ft bgs
NUMBER **FIRST WATER:** n/a ft bgs

DEPTH (ft-bgs)	DESCRIPTION (1) Unit/Formation, Mem. 2) Soil/Rock Name 3) Color 4) Moisture 5) Grain Size 6) Percentage (gravel,sand,fines) 7) Plasticity 8) Density/Consistency 9) Structure 10) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	WELL COMPLETION DETAILS	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOWS PER 6"	RECOVERY (%)	PID READING (ppm)	TIME (00:00)	COMMENTS (1) Rig Behavior (2) Air Monitoring
0	Serpentinite BEDROCK: Olive (5Y 4/4), weathered			Flush mount well box	32							
				CASING: 4in. Schedule 40 PVC								
2	@ 2 ft color change to olive gray; shaly or platy structure; intensely fractured; low hardness; moderate weathering				31			27				
				Static water 3.27 ft bgs	30			50		0		
4					29							
				GROUT: Bentonite-cement seal 0.5 - 12.5 ft	28							
6					27							
					26							
8	@ 7 ft color change to dark greenish gray (5GY 4/1); moist				25			18 20 23				
	@ 8.5 ft color change to greenish gray, yellowish brown stainging on fracture surfaces				24			24				
10					23							
					22							
12					21							
	@ 12 ft color change to dark greenish gray; shaly or platy structure, low hardness			SEAL: Bentonite pellets 12.5 - 14.5 ft	20			16 15 25				
14	@13 ft color change to very dark gray; moist to wet; hard; moderately strong				19			30		0		
	@ 14 ft Low hardness; platy or shaly structure			TRANSITION SAND: Lonestar #60, 14.5 - 15.5 ft	18							
16	Greenstone BEDROCK: Dark bluish gray (5B 4/1); intensely fractured, white vein filling mineral in fractures; moderately hard to hard; moderately strong; moderately weathered			FILTER PACK: Lonestar #3, 15.5 - 28.0 ft	17							Driller notes harder drilling.
					16							
18					15							
					14							
20				SCREEN: 4" Schedule 40 PVC, 0.02in slots	13							
					12							
22					11							
					10							
24					9							
					8							
26					7							
					6							
28				Bottom well cap 28.5ft	5							
	BOREHOLE TERMINATED. Total depth = 28.5 ft bgs				4							
30					3							
					2							
32					1							
					0							
34					-1							
					-2							

CONTRACTOR: **NORTHING:**
EQUIPMENT: Drill Systems 1000 (ACH) **EASTING:**
DRILL MTHD: **COORDINATE SYSTEM:**
HAMMER TYPE:
BOREHOLE DIAMETER: 10"

LOGGER **REVIEWER**

NOTES: Original well installed at 32.94ft msl, total borehole depth 46.5ft bgs. Logging and well installation performed in 1993. Proposed excavation to 18ft below current ground surface. Water level (14.02 ft msl) measured in 1Q2014.

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

WELL_BORE_GE HUNTERS POINT.GPJ GEOSNTEC.GDT 1/26/15

APPENDIX G

Unexpected Conditions Response Plan

(Final Risk Management Plan - Appendix H, March 2015, Rev. 0)

Geosyntec consultants

UNEXPECTED CONDITION RESPONSE PLAN

TABLE OF CONTENTS

FLOWCHARTS

Geosyntec consultants

1. UNEXPECTED CONDITIONS – APPROACH

This Unexpected Condition Response Plan (UCRP) addresses the discovery of Unexpected Conditions during development activities within the Property. Although investigation and remediation has already been implemented by the Navy and an approved remedy is in place, Unexpected Conditions could potentially be encountered during the course of development. An Unexpected Condition is a condition observed in the soil, soil vapor, sediment and/or groundwater that indicates the potential for hazardous substances and/or petroleum substances to exist beneath the Property at a location that has not previously been identified, characterized, or remediated by the Navy. By way of example, Unexpected Conditions may include visibly discolored soil and/or contaminated groundwater in an area not previously identified by the Navy, soil and/or groundwater exhibiting a strong chemical odor in an area not previously identified by the Navy, unexpected subsurface structures (e.g., pits, sumps, underground storage tanks, etc.), radioactive materials, material potentially presenting an explosive hazard (MPPEH), and/or other visual or olfactory evidence of a historical release at a location not previously identified by the Navy.

This UCRP establishes protocols for the assessment and response to the discovery of an Unexpected Condition and for a path forward such that development activities can continue safely and timely within the context of the approved remedy. The UCRP protocols provide for initial oversight by and consultation with the San Francisco Department of Public Health (SFDPH); for notification to and consultation with the Federal Facility Agreement (FFA) Signatories; and for possible longer-term oversight by the FFA Signatories depending on the circumstances and nature of the response. As a component of the Site-specific health and safety training that will be required of equipment operators and site workers, instruction will be given on how to identify and respond to potential Unexpected Conditions. Details of health and safety training, including additional onsite protocols for identification and handling of potentially hazardous materials, will be provided in the Site-specific Environmental Health and Safety Plan (EHSP), an outline for which is provided in Appendix D to this RMP.

This UCRP is intended to fulfill the requirements of Article 31 of the San Francisco Health Code (http://www.amlegal.com/nxt/gateway.dll/California/health/article31

hunterspointshipyard?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca) for preparation of an unknown contaminant contingency plan. The Owner may address Unexpected Conditions by following the steps outlined in this UCRP; however, at any time after the discovery of an Unexpected Condition, the Owner may elect to request the Navy to take responsibility for the condition. In addition, under specified circumstances the UCRP requires that the Owner consult with the FFA Signatories to determine whether a new CERCLA action by the Navy is required. If the Navy takes responsibility for the condition, the Owner must suspend all work at the location of the condition pending completion of Navy response to allow the Navy adequate access to implement the response.

2. RESPONSE PLAN

This Section identifies how Unexpected Conditions shall be addressed, the general approach of which is presented in the attached flowchart H-1. The primary objectives outlined in Flowchart H-1 are to: i) provide initial notification of and response to the discovered condition to the appropriate agencies; ii) assess if the Unexpected Condition is a Category 1 Condition (described below); iii) make a preliminary determination as to whether the condition qualifies as a potential Category 2 Condition; iv) prescribe the collection and analysis of initial samples; and v) determine whether any response action is required. A Category 2 Condition for which a response action is required will then follow the course of action specified in Flowcharts H-2 (pertaining to petroleum substances only) and H-3 (pertaining to hazardous substances or hazardous substances comingled with petroleum substances).

2.1 Initial Assessment Procedures

Upon the discovery of a potential Unexpected Condition, the Owner shall suspend work and immediately notify the Site Safety and Health Officer (SSHO). The SSHO will assist the Owner with the initial assessment procedures described herein to ensure that work proceeds in a safe manner.

After notifying the SSHO, the Owner must first conduct an initial assessment to identify the nature of the condition. The nature of the condition will be described as one of two categories of conditions, as follows:

- **Category 1 Condition**: A Category 1 Condition could be an immediate hazard to construction workers and warrants coordination between the developer, the SFDPH, and the FFA Signatories. Category 1 Conditions include radioactive materials and MPPEH. By way of example, radioactive materials include buried luminescent dials, radioactive aircraft deck markers, luminescent gauges and signs, and sandblast grit. MPPEH materials that might be found include empty shell casings, discarded spent military munitions, and munitions debris containing chemical residue.
- **Category 2 Condition**: A Category 2 Condition is less likely to represent an immediate hazard to construction workers and warrants coordination with the

SFDPH in consultation with the FFA Signatories, as appropriate. By way of example, Category 2 Conditions include hazardous substances and/or petroleum substances in soil, soil vapor, and/or groundwater. A Category 2 Condition may involve hazardous substances only, petroleum substances only, or a comingled condition of both. The preliminary determination will be made based on initial observations, field screening, and/or laboratory analyses, as described in Section 2.2 of this Appendix. As appropriate, initial assessment of the Unexpected Condition could also include excavation and segregation of soil that contains visual or olfactory evidence of hazardous or petroleum substances to provide an indication of the magnitude and geographic extent of the condition.

If the condition is determined to be a Category 1 Condition, the Owner will stop work, secure the area, notify the SFDPH and FFA Signatories within 24 hours of the determination that the condition is a Category 1 Condition, and Consult with FFA signatories to determine the appropriate response action. In the case of radioactive materials, the Owner will consult with SFDPH and FFA signatories to determine the appropriate response and may request the Navy to take appropriate action. In the case of MPPEH, the Owner will consult with SFDPH and FFA signatories to determine the appropriate response, and, in the case of suspected unexploded ordnance, notify the San Francisco Police Department Bomb Squad to take appropriate action. In either case, the FFA Signatories and the SFDPH may require that a response plan be submitted for review and approval prior to initiating the action. This process is documented in Flowchart H-1, Boxes 1, 1B, and 1C. Although work will be stopped at the location of the discovered Condition until an approved response action is completed, work may proceed at other locations not affected by the Condition, unless otherwise directed by the Navy, under the guidance of the Risk Management Plan (RMP).

If the Unexpected Condition is determined to be a Category 2 Condition, the Owner will notify the SFDPH and the FFA Signatories of the discovery within 24 hours of the determination that the Condition is a Category 2 Condition. Following the notification, the Owner will proceed with the initial assessment to determine the nature of the Condition. This process is documented in Flowchart H-1, Boxes 1A, 2, 2A, and 2B.

The initial assessment actions will be performed in accordance with applicable federal and state laws and regulations and the Site-specific EHSP and appropriate measures will

be undertaken to ensure that assessment activities will be conducted in a safe manner. The SSHO will be responsible for performing activity hazard analyses, evaluating any change in site conditions, and modifying the EHSP accordingly. The SSHO has the authority to stop work if an unsafe condition arises.

2.2 Category 2 Condition Assessment Procedures

Following the notification of the initial discovery and upon concurrence from the SFDPH and the FFA Signatories, the Owner will proceed with further assessment of a Category 2 Condition until the condition can be classified as a hazardous substance condition, petroleum substance condition, or a co-mingled condition. The assessment procedures are documented in Flowchart H-1, Boxes 2, 2A, and 2B. Assessment work shall be conducted by a competent and Registered Professional.

The assessment may include the use of one or more field screening instruments: organic vapor monitor (OVM), photoionization detector (PID) x-ray fluorescence (XRF), gamma ray spectrometer, etc., physical observation (visual and olfactory characteristics), and sampling and chemical testing of the exposed affected media (soil, soil gas, groundwater, sediment, etc.). The assessment of the Condition may also include excavation and segregation of soil that contains visual or olfactory evidence of contamination to provide an indication of the magnitude and geographic extent of the Condition. In the event that some amount of excavation will occur, the Owner will follow the soil management protocol specified in the RMP (Section 5.3). Field documentation will be generated that describes the location and type of the affected media, describes samples collected (number, location, type), conveys results of any field screening (OVM, PID, XRF, etc.) results, provides volume estimates of excavated/stockpiled material, and describes stockpile control measures.

The samples will be collected in accordance with industry standard protocols and collection procedures and regulatory agency guidance documents as identified by the competent and licensed professional overseeing the work. A minimum of one investigation sample and corresponding quality control (QC) samples (duplicate, travel blank, equipment blank, etc.) will be collected for each media (liquid in object, soil, sediment, soil vapor, or groundwater) that is suspected to be impacted. In addition to primary samples, duplicate samples and other applicable QC samples will be collected

and submitted for analysis. As an initial screen, collected samples may be analyzed for the following constituents:

- Volatile organic compounds (VOCs), including fuel oxygenates by EPA Test Method 8260B or approved equivalent;
- Semi-volatile organic compounds (SVOCs), including polycyclic aromatic hydrocarbons (PAHs) by EPA Test Method 8270C or approved equivalent;
- CAM 17 Metals by EPA Test Method 6010B/7400 or approved equivalent;
- Pesticides by EPA Test Method 608 or EPA Test Method 8081A or approved equivalent;
- Polychlorinated biphenyls (PCBs) by EPA Test Method 608 or EPA Test Method 8082 or approved equivalent;
- TPH-gasoline range organics (TPH-gasoline) by EPA Test Method 8015B or approved equivalent;
- TPH-diesel range organics (TPH-diesel) by EPA Test Method 8015B or approved equivalent;
- TPH-motor oil range organics (TPH-motor oil) by EPA Test Method 8015B or approved equivalent; and
- Radionuclides radium-226 and cesium-137 by EPA Methods 903.1 and 901.1 or approved equivalent.

Analyses will be selected to correspond with the suspected constituents of potential concern (COPCs) at the location being assessed. Conditions that will be considered in selecting the analysis include previous work conducted by the Navy at the location, known conditions as documented in Navy reports for the location, history of hazardous substance and/or petroleum use at the location as documented by the Navy, field observations, and other anecdotal information. The results of the initial sampling will be compared to the Petroleum Program Strategy Preliminary Screening Criteria (PSC) and/or applicable Record of Decision (ROD) remediation goals. In the event that a constituent is detected that is not listed in the Petroleum Program Strategy PSC and/or applicable ROD remediation goals, the most recent version of the EPA's Regional

Screening Levels (RSLs) and DTSC screening levels will be used. Evaluation of the analytical results will allow the Owner to make an initial determination whether the Condition is:

1. A Condition that does not require further response or regulatory oversight; or,
2. A petroleum Condition that requires further evaluation and response; or,
3. A hazardous substance/comingled Condition that requires further evaluation and response.

Based on the evaluation of the results of the chemical testing, the Owner will then inform the SFDPH and the FFA Signatories of its findings, conclusions, and recommendations (See Flowchart H-1, Boxes 2B and 3). If sampling and analysis is conducted without a FFA signatory approved QA/QC plan, the results will be subject to acceptance by the FFA signatories. The determination will be made, in summary, as follows:

No Further Response. No further response or regulatory oversight is required if: i) the Condition is a petroleum substance Condition; ii) petroleum constituents in samples are below Tier 1 Petroleum PSC; and iii) and the Condition is not a subsurface object or structure (Flowchart H-1, Boxes 4, 4A, 4B, and 4C). In addition, no further response or regulatory oversight is required if: i) the Condition is a hazardous substance/petroleum substance co-mingled Condition; ii) the hazardous substances in samples are below ROD remediation goals or RSL if not listed in the ROD; iii) any petroleum constituents are beneath Tier 1 Petroleum PSC; and iv) the Condition is not a subsurface object or structure. In such cases, the Owner shall notify SFDPH and the FFA Signatories of its findings (including analytical results), prepare and submit a Closure Report to the SFDPH and FFA Signatories, and upon approval of the Closure Report by the SFDPH and FFA Signatories proceed with redevelopment work under the guidance of the RMP (Flowchart H-1, Boxes 5, 5A, 5B, and 5C).

Additional Petroleum Evaluation and Response. Additional evaluation and response is required if: i) the Condition is a petroleum substance Condition; and ii) petroleum substances in samples are above Tier 1 Petroleum PSC; or iii) the Condition is a subsurface object or structure (Flowchart H-1, Boxes 4, 4A, 4D, and 4E). If in the

course of evaluating the Unexpected Condition, the soil exhibits a total TPH concentration equal or greater than the Navy's petroleum Source Criterion for soil (3,500 mg/kg total-total petroleum hydrocarbons), the soil will be managed as if it contains separate-phase petroleum product. In such cases, the Owner shall notify the SFDPH and the FFA Signatories of its findings (including analytical results) and proceed with the evaluation and response in conjunction with the development activities as described in Section 3 below and as identified in Flowchart H-2.

Additional Hazardous Substance Evaluation and Response. Additional evaluation and response is required if: i) the Condition is a hazardous substance/petroleum substance co-mingled Condition; ii) the concentration of the hazardous substances in samples are above applicable ROD remediation goals or RSL if not listed in the ROD; or iii) the Condition is a subsurface object or structure. In such cases, the Owner shall notify the SFDPH and the FFA Signatories of its findings (including analytical results) and proceed with the evaluation and response in conjunction with the development activities as described in Section 4 below and as specified in Flowchart H-1, Box 5, 5A, 5D, 5E, and Flowchart H-3.

3. PETROLEUM SUBSTANCE CONDITION

If the Owner, the SFDPH, and FFA Signatories have determined that the Unexpected Condition is a petroleum substance Condition, evaluation and response work will proceed following the process outlined in Flowchart H-2. In general, all work will comply with the Preliminary Screening Criteria and Petroleum Strategy (Shaw, 2007). Work will occur under the oversight of the RWQCB with notification to and consultation with the SFDPH as appropriate. Completion of petroleum substance evaluation and response under this UCRP will be documented in a Site Closure Report submitted for the RWQCB review and approval or, under certain circumstances identified below, preparation of a condition-specific CAP may be necessary, with RWQCB review and approval, in consultation with the SFDPH.

If the Unexpected Condition encountered is a physical object(s) determined to contain or have contained petroleum substances only, including such objects as a UST, pipelines, sump, drum or other containers, the object(s) will be removed in consultation with the RWQCB (Flowchart H-2, Box 2B), and in accordance with applicable SFDPH permitting procedures. Upon removal of the object(s), the surrounding material will be assessed for visual evidence, olfactory evidence, and with field instruments for evidence of petroleum substances. Affected material will be designated as such on the basis that it appears discolored, as compared to surrounding Bay Fill/native soil, and it exhibits a chemical odor, and field monitoring instruments register a concentration that exceeds levels typical of Bay Fill/Native soil. Removal of the affected material will proceed as presented in Section H3.1 and Flowchart H-2, Box 2A.

If there is no evidence of additional contamination in the excavation, other than the removed physical object, final confirmation soil samples from the excavation will be collected. Final confirmation soil samples will be collected for analysis in accordance with the procedures specified in the Petroleum Corrective Action Plan (PCAP). The collected soil samples will be analyzed for the following constituents, as applicable, and based on initial sample results of the contents of the removed object:

- TPH-gasoline;
- TPH-diesel;

- TPH-motor oil;
- BTEX, MTBE; and,
- PAHs.

Soil sample results will be screened against the Tier 1 Petroleum PSC for shallow soils (<10 feet below ground surface [bgs], residential reuse, non-drinking water resources) (Shaw, 2007). If soil samples contain COPCs above the Tier 1 Petroleum PSC, removal of the affected material or further evaluation will proceed as presented in Section 3.1.

If soil samples do not contain concentrations of petroleum substances above the Tier 1 Petroleum PSC and no groundwater was encountered, a Site Closeout Report will be prepared documenting a no further action recommendation for RWQCB approval. Upon submittal of the Closeout Report, development activities will continue under the guidance of the RMP or approved Restricted Activities Work Plan.

Groundwater encountered during the removal of the object(s) will be addressed as presented in Section 3.2.

3.1 Excavation of Petroleum Affected Material

If affected material is encountered during the removal of an object(s) or as a stand-alone material, excavation and segregation of the affected material will proceed. The excavated affected material will be segregated, stockpiled, and secured pending characterization sampling for reuse, further treatment, or offsite disposal (Flowchart H-2, Boxes 10B, 14, 14B, 15, 15B, and 14A). The excavation will incrementally extend laterally and vertically to the maximum extent feasible to remove affected material. Vertical excavation will extend until the affected material is removed to an initial depth of 10 feet bgs or groundwater is encountered, whichever is shallower. If affected material extends past the initial depth of removal (10 feet bgs or first groundwater, whichever is shallower), the RWQCB will be notified and consulted to determine if the residual contamination represents a human and/or ecological hazard based on existing subsurface conditions, nature of the contamination, and proposed development plan for the area. If, during the excavation of the affected material, the volume of the excavated

material exceeds 100 cubic yards, the RWQCB will be notified and excavation of additional material will continue.

Upon removal of the affected material, excavation confirmation samples will be collected for analysis in accordance with the procedures specified in the PCAP (ITSI, 2009). Excavation confirmation soil samples will be analyzed for the presence of the following constituents, as applicable, based on initial characterization results of the contents of the removed object and/or encountered stand-alone affected material:

- TPH-gasoline;
- TPH-diesel;
- TPH-motor oil;
- BTEX/ MTBE; and,
- PAHs.

The results of the excavation confirmation soil samples will be compared to the Tier 1 Petroleum PSC for shallow soil (Shaw, 2007).

If concentrations of petroleum substances remaining in the excavation are below the Tier 1 Petroleum Program Strategy screening levels, the RWQCB will be notified, excavation will stop, and characterization samples of the excavated segregated material will be collected as described in Section 3.3 (Flowchart H-2, Boxes 10, and 10B).

If, however, the concentrations of remaining chemicals of potential concern (COPCs) are above the Tier 1 Petroleum Program Strategy screening levels, an evaluation of the site conditions using the framework in the Low-Threat UST Case Closure Policy (SWRCB Resolution 2012-0016) will be made in consultation with the RWQCB. If the Low-Threat criteria evaluation indicates that the site is suitable for no further action, no additional soil removal will occur, and characterization samples will be collected from the excavated segregated material as per Section 3.3 (Flowchart H-2, Boxes 10A, 10B, and 11). If the Low-Threat Criteria evaluation indicates that the site requires further action, Owner shall consult with the RWQCB to determine whether excavation and

segregation of the affected material will continue, or whether preparation of a Site-specific CAP is required (Flowchart H-2, Box 10A, 11, 12, and 13).

3.2 Encountered Groundwater

If excavation of affected soil extends to groundwater and groundwater has a measureable TPH free-product thickness of greater than 0.01 feet, the RWQCB and SFDPH will be notified and both agencies consulted to determine if preparation of a Site-specific CAP is required (Flowchart H-2, Boxes 3A, 4A, 5A, and 7A). If groundwater without measurable free product is encountered, a groundwater sample will be collected and analyzed for the presence of the following constituents, as applicable, and based on initial characterization results of the contents of the removed object and/or encountered stand-alone affected material:

- TPH-gasoline;
- TPH-diesel,
- TPH- motor oil;
- BTEX/MTBE; and,
- PAHs.

Groundwater samples will be collected and analyzed according to the procedures outlined in the PCAP. Laboratory results of the collected groundwater sample will be compared to the Tier 1 Petroleum PSC and based on the location of the discovered Unexpected Condition (e.g., distance from the Bay Margin). If total TPH, BTEX, PAH, or MTBE concentrations in the collected groundwater sample exceed the Tier 1 Petroleum PSC for the location where the TPH Unexpected Condition was encountered, the SFDPH will be notified and consultation with the RWQCB will take place to determine if preparation of a Site-specific CAP is necessary (Flowchart H-2, Boxes 7B, 5A, and 7A). If encountered groundwater does not contain TPH COPCs above the Tier 1 Petroleum PSC, work will continue under the guidance of the RMP and the RWQCB will be notified (Flowchart H-2, Boxes 6A, 7B, and 8).

3.3 Segregated Material Characterization

Segregated material (e.g., soil) derived during removal of the encountered object(s) and/or as part of affected material excavation activities will be sampled for handling and waste disposal purposes. Composite sampling of the segregated material will not be allowed and the number of discrete, segregated material samples collected for waste profiling will be as follows (DTSC, 2001):

Volume of Segregated Material	Samples per Volume
Up to 1,000 cubic yards	1 discrete sample per 250 cubic yards
1,000 to 5,000 cubic yards	4 discrete samples for first 1,000 cubic yards plus 1 discrete sample per each additional 500 cubic yards
Greater than 5,000 cubic yards	12 discrete samples for first 5,000 cubic yards plus 1 discrete sample per additional 1,000 cubic yards

DTSC Information Advisory, Clean Imported Fill Material, October 2001.

Segregated material samples will be analyzed for the following constituents, as appropriate, and based on the initial characterization analytical results collected when the affected material was first encountered:

- TPH-gasoline;
- TPH-diesel;
- TPH-motor oil;
- BTEX, MTBE; and/or,
- PAHs.

Sample results will be provided to candidate waste disposal facilities for comparison with waste disposal acceptance criteria. The material will be disposed at a Class I, Class II, or Class III waste disposal facility that is permitted to accept the waste as characterized by the waste profile.

As an alternative to disposal at a Class I or Class II waste disposal facility, the Owner may consult with the RWQCB to determine if onsite treatment is an option (Flowchart H-2, Boxes 14B and 15). If onsite treatment is approved, the segregated material will be treated until petroleum COPC concentrations are below:

- Tier I Petroleum PSC for shallow soil; or,
- Soil Import Plan screening criteria; or,
- Waste acceptance criteria for Class III disposal.

Treated soil with COPC concentrations below the Tier 1 Petroleum PSC may be used as fill material and placed under the Durable Cover. Treated soil with petroleum COPC concentrations below the Soil Import Plan (Appendix F) screening criteria may be used as clean fill for the Durable Cover. Treated soil that is not used as onsite fill and that meets Class III disposal criteria may be disposed offsite at a Class III landfill. The Owner will notify the RWQCB of its intent to handle and place or dispose of the treated soil and prepare a Site Closeout Report for review and approval (Flowchart H-2, Box 14A).

If onsite treatment is not approved, the excavated material will be hauled offsite for disposal at a Class I, Class II, or Class III waste disposal facility that is permitted to accept the waste as characterized by the waste profile (Flowchart H-2, Box 15A). After disposal of the segregated material, no further action will be recommended and a Site Closure Report will be prepared and submitted for RWQCB approval.

4. HAZARDOUS SUBSTANCES CONTAMINATION

If, during the initial evaluation of the analytical results for a physical object and/or affected material (described herein at Section 2.2), the Unexpected Condition is determined to require additional evaluation and response (Flowchart H-1, Box 5E), the following process will be undertaken as outlined in the Hazardous Substances Unexpected Condition Flowchart (Flowchart H-3). Work will occur under the oversight of the SFDPH, except in two circumstances: i) where the work requires a new CERCLA action or decision document because hazardous substances are identified at levels above ROD remediation goals or a new hazardous substance is identified as specified in Sections 4.1 and 4.2 below; or ii) the SFDPH or the FFA Signatories determine on a case-by-case basis at any point in the process described in this Section H4.0 that it is more appropriate for technical or regulatory reasons for specific work to be conducted under the oversight of a designated FFA signatory. References to "SFDPH" in this section are deemed to be references to the designated FFA Signatory in any instance in which the SFDPH or the FFA Signatories have determined oversight by a designated FFA Signatory is appropriate. Completion of hazardous substances contamination evaluation and response under this UCRP will be documented in a Closure Report submitted for SFDPH review and approval. Where a new CERCLA action or decision document is determined to be necessary under the circumstances specified in Sections H4.1 and H4.2 below or an FFA Signatory oversees the work, the developer will obtain any necessary approvals from the appropriate FFA Signatory or FFA Signatories.

If the Unexpected Condition encountered is a physical object(s), including such items as USTs, sumps, drums, or other containers, the object(s) will be removed in consultation with the SFDPH and in accordance with applicable SFDPH permitting requirements, and the FFA Signatories will be notified (Flowchart H-3, Box 2B). Upon removal of the object(s), the surrounding material will be assessed for physical characteristics (visibly stained soil and chemical odor) and screened with field instruments for evidence of contamination. Affected material will be designated as such on the basis that is appears discolored, as compared to surrounding Bay Fill/Native Soil, it exhibits a chemical odor, and field monitoring instruments register a concentration that exceeds levels typical of Bay Fill/Native Soil. Removal of the affected material will proceed as presented in Section H4.1.

If there is no evidence of additional affected material in the excavation, other than the removed physical object, final soil confirmation samples will be collected from the excavation in accordance with the procedures outlined in the Navy's Parcel-specific Remedial Action Work Plan (RAWP). Collected soil samples will be analyzed for the following constituents, as applicable, and based on initial assessment results of the contents of the removed object:

- VOCs including MTBE;
- SVOCs;
- CAM 17 Metals;
- Pesticides;
- PCBs;
- TPH-gasoline;
- TPH-diesel; and,
- TPH-motor oil.

Collected soil sample results will be screened against the applicable ROD remediation goals or RSL if not listed in the ROD and Tier 1 Petroleum PSC. If soil samples contain COPCs above the applicable ROD remediation goals Tier 1 Petroleum PSC, or RSLs if not listed in the ROD, removal of the affected material will proceed as presented in Section H4.1.

If soil samples do not contain COPCs above ROD remediation goals Tier 1 Petroleum PSC, or RSLs if not listed in the ROD, a Closure Report will be prepared for SFDPH review and approval, the FFA Signatories will be notified, and work will continue under the guidance of the RMP (Flowchart H-3, Boxes 1, 2B, 3B, 4B, 5B, and 6B). If it is determined that no additional sampling of the excavation is necessary, and no groundwater was encountered (Flowchart H-3, Boxes 1, 2A, 3A, and 8), excavation will stop, and characterization of the excavated segregated material (excavated during the removal of the subsurface object) will proceed as per Section H4.3 (Flowchart H-3, Boxes 8, 9, and 9B).

Encountered groundwater during the removal of the object(s) will be addressed as presented in Section H4.2.

4.1 Excavation of Material with Hazardous Substances

If material with hazardous substances is encountered during the removal of an object(s) or as a stand-alone material, the excavated affected material will be segregated, stockpiled, and secured pending characterization sampling for reuse, further treatment, or offsite disposal as per Section H4.3. The excavation will incrementally extend laterally and vertically to the maximum extent feasible to remove obviously affected material. In the case of affected material that cannot be readily identified by physical characteristics, the use of field screening instrumentation such as a PID or OVM will be implemented to assess the appropriate lateral and vertical extent of the excavation. Vertical excavation will extend until obviously affected material is removed to a depth of 10 feet bgs or the depth at which groundwater is encountered, whichever is shallower.

Upon removal of the affected material, soil confirmation samples will be collected from the excavation as specified in the Navy's Parcel-specific RAWP. Soil confirmation samples will be analyzed for the presence of the following constituents, as applicable, and based on initial characterization results of the contents of the removed object and/or encountered stand-alone affected material:

- VOCs (including methyl tert-butyl ether [MTBE]);
- SVOCs;
- CAM 17 Metals;
- PCBs;
- Pesticides;
- TPH-gasoline;
- TPH-diesel; and,
- TPH-motor oil.

The results of the excavation confirmation samples will be compared to the applicable Parcel-specific ROD remediation goals or Tier 1 Petroleum PSC or RSLs if not listed in the ROD.

If concentrations of COPCs remaining in the excavation are below the applicable screening levels, the SFDPH and the FFA Signatories will be notified, excavation will stop, and characterization samples of the excavated segregated material will be collected as per Section 4.3 (Flowchart H-3, Box 9B).

If, however, the concentrations of remaining COPCs are above the applicable screening levels, the SFDPH and the FFA Signatories will be notified and consulted to determine if the residual contamination represents a human and/or ecological hazard based on existing subsurface conditions, nature of the contamination, and proposed development plan for the area, in which case, a new CERCLA action by the Navy may be necessary. Owner will prepare a technical memorandum and recommendation for FFA Signatory review and determination (Flowchart H-3, Box 9A).

4.2 Encountered Groundwater

If excavation of affected soil extends to groundwater, a groundwater sample will be collected in accordance with the Navy's Parcel-specific RAWP. The collected groundwater sample will be analyzed for the presence of the following constituents, as applicable, and based on initial characterization results of the contents of the removed object and/or encountered stand-alone affected material:

- VOCs (including MTBE);
- SVOCs;
- CAM 17 Metals;
- PCBs;
- Pesticides;
- TPH-gasoline;
- TPH-diesel; and,

- TPH-motor oil.

If COPCs concentrations in the collected groundwater sample exceed the applicable ROD remediation goal (Flowchart H-3, Box 5A), Tier 1 Petroleum PSC (if applicable), or RSLs if not listed in the ROD, the SFDPH will be notified and the FFA Signatories will be consulted to determine if a new CERCLA action is required. In this case, Owner will prepare a technical memorandum and recommendation for FFA Signatory review and determination. If the concentrations of COPCs in the groundwater sample do not exceed the appropriate screening levels, work will proceed under the guidance of the RMP under SFDPH oversight, and the FFA Signatories will be notified (Flowchart H-3, Box 7).

If VOCs are present, collection of soil vapor samples may be required according to the DTSC Vapor Intrusion Guidance (DTSC, 2011 and 2012) to evaluate whether the area should be designated as a VOC Area Requiring Institutional Controls (ARIC). The results of the soil vapor sample analysis will then be compared to the Soil Gas Action Levels (SGALs) established for the Site. If soil vapor sample(s) were collected and COPC concentrations in the collected soil vapor sample(s) exceed the applicable SGAL and the area is not already in a designated VOC ARIC, the SFDPH will be notified and the FFA Signatories will be consulted to determine if the area should be added to the VOC ARIC designation or whether other action is required (Flowchart H-3, Boxes 6, 6A, and 6C). If soil vapor sample(s) were collected and COPC concentrations in the collected soil vapor sample(s) do not exceed the appropriate SGALs, work will proceed under the guidance of the RMP under SFDPH oversight, and the FFA Signatories will be notified (Flowchart H-3, Box 6D).

4.3 Segregated Material Characterization

Segregated material (e.g., soil) will be sampled for characterization purposes. Composite sampling of the segregated material will not be allowed and the number of discrete segregated material samples collected for characterization will be as follows (DTSC, 2001):

Volume of Segregated Material	Samples per Volume

Up to 1,000 cubic yards	1 discrete sample per 250 cubic yards
1,000 to 5,000 cubic yards	4 discrete samples for first 1,000 cubic yards plus 1 sample per each additional 500 cubic yards
Greater than 5,000 cubic yards	12 discrete samples for first 5,000 cubic yards plus 1 discrete sample per additional 1,000 cubic yards

Data from DTSC Information Advisory, Clean Imported Fill Material, October 2001.

Samples will be analyzed for the following constituents, as applicable, and based on the initial characterization analytical results collected when the affected material was first encountered:

- VOCs, (including MTBE);
- SVOCs;
- CAM 17 Metals;
- PCBs;
- Pesticides;
- TPH-gasoline;
- TPH-diesel; and,
- TPH-motor oil.

Sample results will be provided to candidate waste disposal facilities for comparison with waste disposal acceptance criteria. The material will be disposed at a Class I, Class II, or Class III waste disposal facility that is permitted to accept the waste as characterized by the waste profile (Flowchart H-3, Boxes 9B, 10, 10A, 11, and 11B).

For segregated material with COPCs concentrations exceeding ROD remediation goals or RSLs if not listed in the ROD for soil, the SFDPH will be consulted to determine if onsite treatment of hazardous substance- contaminated soils is viable. If onsite treatment of contaminated soil is approved by the SFDPH, the soil will be treated and re-sampled until hazardous substance concentrations are below the applicable screening levels (Flowchart H-3, Boxes 9B, 10, 10A, 11, 11A, and 10B). Once ROD remediation

goals Tier 1 Petroleum PSC, and/or RSLs if not listed in the ROD have been met, the treated soil may be used as fill material and placed under the Durable Cover. A Closure Report will be prepared and submitted to the SFDPH for review and approval, the FFA Signatories will be notified, and additional work will proceed under the guidance of the RMP (Flowchart H-3, Box 10B).

If onsite treatment is not approved by the SFDPH, Owner will dispose of the material in accordance with applicable laws and regulations. The Owner will prepare a Closure Report for SFDPH approval and will notify the FFA Signatories (Flowchart H-3, Box 11B).

5. REFERENCES

Department of Toxic Substances Control (DTSC), 2001. Information Advisory, Clean Imported Fill Material. October.

DTSC, 2012, Advisory – Active Soil Gas Investigations. April

DTSC, 2011. Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). October.

ITSI, 2009. Final Project Work Plan Petroleum Hydrocarbon Corrective Action Parcel B. June.

Shaw Environmental Inc. (Shaw), 2007. Final New Preliminary Screening Criteria and Petroleum Program Strategy, Hunters Point Shipyard, San Francisco, California. 21 December.

USEPA, 2014. Region IX Regional Screening Levels. May.

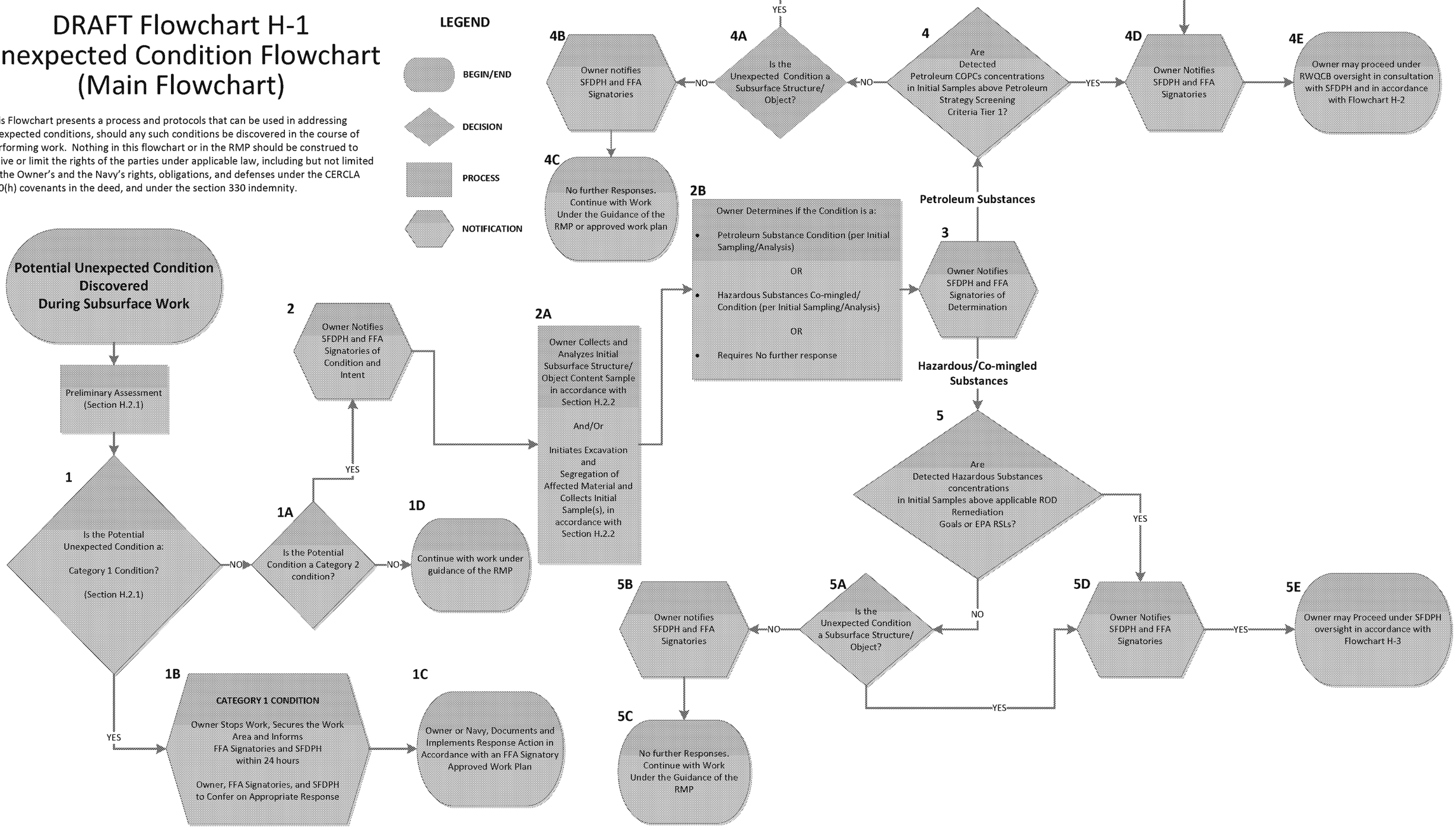
FLOWCHARTS

FLOWCHART H-1

Unexpected Condition Flowchart

DRAFT Flowchart H-1
Unexpected Condition Flowchart
(Main Flowchart)

This Flowchart presents a process and protocols that can be used in addressing unexpected conditions, should any such conditions be discovered in the course of performing work. Nothing in this flowchart or in the RMP should be construed to waive or limit the rights of the parties under applicable law, including but not limited to the Owner's and the Navy's rights, obligations, and defenses under the CERCLA 120(h) covenants in the deed, and under the section 330 indemnity.



REGULATORY AGENCIES:
US ENVIRONMENTAL PROTECTION AGENCY (EPA)
DEPARTMENT OF TOXICS SUBSTANCES AND CONTROL (DTSC)
REGIONAL WATER QUALITY CONTROL BOARD (RWQCB)
SAN FRANCISCO DEPARTMENT OF PUBLIC HEALTH (SFDPH)

FFA SIGNATORIES:
US ENVIRONMENTAL PROTECTION AGENCY (EPA)
DEPARTMENT OF TOXICS SUBSTANCES AND CONTROL (DTSC)
REGIONAL WATER QUALITY CONTROL BOARD (RWQCB)
US DEPARTMENT OF THE NAVY (NAVY)

Category 1:
- Radiological materials
- MPPEH

Category 2:
- Hazardous substances
- Petroleum substances
- Commingled

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FLOWCHART H-2

Petroleum Unexpected Condition

March 2015 (Revision 0)

DRAFT Flowchart H-2 Petroleum Unexpected Condition Flowchart

This Flowchart presents a process and protocols that can be used in addressing unexpected conditions, should any such conditions be discovered in the course of performing work. Nothing in this flowchart or in the RMP should be construed to waive or limit the rights of the parties under applicable law.

LEGEND

- BEGIN/END
- DECISION
- PROCESS
- NOTIFICATION
- Subsurface Object Path
- Soil Contamination Path

1 **Petroleum Unexpected Condition Discovered During Subsurface Work**

Soil Contamination

Subsurface Object

2A Excavate and Segregate Visibly/ Olfactorily/Instrument-Screened Affected Material (Section H.3.0)

2B Remove UST/Object in consultation with RWQCB. Dispose of Removed UST/Object Off-Site (Section H.3.0)

3A Was Groundwater Encountered During the Excavation/ Removal of the Affected Material? — NO

3B Is there Visual or Olfactory Evidence of Contamination in the UST/ Object Excavation? — YES

4A Is There Free Product Present at a Thickness of >0.01 ft? — NO

4B Collect Soil Samples from the UST/Object Excavation. Analyze Samples for constituents as Appropriate Based on Initial Sample Results collected via Flowchart H-1, Box 2

5A Notify SFDPH and RWQCB

5B Do **Excavation Confirmation Samples** Indicate Petroleum Chemicals of Potential Concern (COPCs) **Above** Tier 1 Petroleum Program Strategy Screening Levels — YES / NO

6A Collect Groundwater Samples in accordance with Section H.3.2

6B Continue with Work Under the Guidance of the RMP. Prepare Site Closeout Report and No Further Action Recommendation for RWQCB Review and Approval

7A Consult with RWQCB and Determine if a Corrective Action Plan for Review and Approval is Required for Groundwater. If Required, Owner may Proceed with Preparation and Implementation of Corrective Action Plan (Section H.3.2) Continue with Soil Work Under this Flowchart

7B Do Groundwater Sample(s) Indicate Petroleum COPCs Above Screening Levels? — YES / NO

8 Continue with Work Under the Guidance of the RMP

9 Is Excavated Material Volume Greater Than 100 Cubic Yards? — NO / YES

9A Notify RWQCB. Proceed with Additional Excavation

9B Collect **Excavation Confirmation** Samples per Section H.3.1. Analyze **Excavation Confirmation** Samples for constituents as appropriate Based on Initial Sample Results collected via Flowchart H-1, Box 2.

10 Do **Excavation Confirmation Samples** Indicate (COPCs) **Above** Petroleum Program Strategy Tier 1 Screening Levels — YES / NO

10A Evaluate Remaining Conditions Using the Framework in the Low-Threat UST Case Closure Policy in Consultation with RWQCB

10B Collect and analyze **Segregated Material *Characterization* Samples** for constituents as Appropriate Based on Initial Sample Results collected via Flowchart H-1, Box 3 and in accordance with Section H.3.3

11 Does Low-Threat Criteria Evaluation Indicate Site is Suitable for No Further Action? — NO / YES

12 Notify SFDPH and RWQCB

13 Continue Incremental Excavation and Segregation of Affected Material OR Consult with RWQCB and Determine if a Corrective Action Plan for Review and Approval is Required. If required, Owner may Proceed with Preparation and Implementation of Corrective Action Plan

14 Do **Segregated Material Samples** Indicate COPCs **Above** Petroleum Program Strategy Tier 1 Screening Levels in the Segregated Material? — NO / YES

14A Notify SFDPH and RWQCB. Prepare Site Closeout Report and No Further Action Recommendation for Review and Approval. Reuse Segregated Material Under the Durable Cover with RWQCB Approval. Proceed with Additional Work Under the Guidance of the RMP

14B Consult with RWQCB to determine if On-Site Treatment of Petroleum Contaminated Segregated Soils is Allowed

15 Is On-Site Treatment of Petroleum Contaminated Soil Approved? — NO / YES

15A Dispose of Segregated Material Off-Site. Prepare Site Closure Report and No Further Action Recommendation for RWQCB Review and Approval

15B Treat and Resample Segregated Material Until Petroleum Chemical Concentrations are **BELOW** Tier 1 Screening Levels

REGULATORY AGENCIES:
REGIONAL WATER QUALITY CONTROL BOARD (RWQCB)
SAN FRANCISCO DEPARTMENT OF PUBLIC HEALTH (SFDPH)

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FLOWCHART H-3

Hazardous Substance Unexpected Condition

March 2015 (Revision 0)

DRAFT Flowchart H-3 Hazardous Substances Unexpected Condition Flowchart

This Flowchart presents a process and protocols that can be used in addressing unexpected conditions, should any such conditions be discovered in the course of performing work. Nothing in this flowchart or in the RMP should be construed to waive or limit the rights of the parties under applicable law, including but not limited to the Owner's and the Navy's rights, obligations, and defenses under the CERCLA 120(h) covenants in the deed, and under the section 330 indemnity.

LEGEND

- BEGIN/END
- DECISION
- PROCESS
- NOTIFICATION
- Subsurface Object Path
- Soil Contamination Path

1 **Hazardous Substances Unexpected Condition Discovered During Subsurface Work**

Soil Contamination

Subsurface Object

2A Excavate and Segregate Visibly/ Olfactorily/Instrument-Screened Affected Material as per Section H.2.0 and H.4.1

2B Remove UST/Object in Consultation with SFDPH.

Dispose of Removed UST/Object Off-Site

(Section H.4.0)

3A Was Groundwater Encountered During the Excavation/Removal of the Affected Material?

YES

NO

3B Is there Visual or Olfactory Evidence of Contamination in the UST/ Object Excavation?

YES

NO

4A Collect Groundwater Samples in accordance with Section H.4.2

4B Collect Soil Samples from the UST/Object Excavation

Analyze for Constituents as Appropriate Based on Initial Sample Results and in accordance with Section H.4.1

5A Do Groundwater Samples Indicate Hazardous Substances and/or Petroleum COPCs **Above** applicable ROD Remediation Goals, Petroleum Tier 1 Screening Criteria, or RSLs?

NO

YES

5B Do **Excavation Confirmation Samples** Indicate CERCLA Chemicals of Potential Concern (COPCs) **Above** applicable ROD Remediation Goals, Petroleum Tier 1 Screening Criteria, or RSLs?

YES

NO

6 Collect Soil Vapor Samples in Accordance with Section H.4.2

6A Do Soil Vapor Samples Indicate Hazardous Substances Above Applicable SGALs?

YES/NO

6B Notify SFDPH and FFA Signatories

Prepare Closure Report for SFDPH* Review and Approval

Continue with Work Under the Guidance of the RMP

6C Notify SFDPH and FFA Signatories

Prepare recommendation for FFA Signatory Review and Approval on whether a new CERCLA action / decision document is necessary.

6D Owner may Continue with Soil Work Under this Flowchart as per Section H.2.0 and H.4.1

7 Continue with Work Under the Guidance of the RMP

Notify SFDPH and FFA Signatories

8 Collect and analyze **Excavation Confirmation Samples** per Section H.4.1, as Appropriate Based on Initial Sample Results collected via Flowchart H-1, Box 2

9 Do **Excavation Confirmation Samples** Indicate Chemicals of Potential Concern (COPCs) **Above** applicable ROD Remediation Goals and/or Petroleum Tier 1 Screening Criteria or RSLs?

YES

NO

9A Notify SFDPH and FFA Signatories

Prepare recommendation for FFA Signatories Review and Approval on whether a new CERCLA Action / decision document is necessary, or if additional excavation can go forward incrementally.

9B Collect and analyze **Segregated Material Samples** as per Section H.4.3, as Appropriate Based on Initial Sample Results collected via Flowchart H-1, Box 2

10 Do **Segregated Material Samples** Indicate Chemicals of Potential Concern (COPCs) **Above** applicable ROD Remediation Goals, Petroleum Tier 1 Screening Criteria, or RSLs?

NO

YES

10A Prepare recommendation for SFDPH* Approval on whether On-Site Treatment of Hazardous Substances Contaminated Segregated Soils is Appropriate

10B Notify FFA Signatories

Prepare Closure Report for SFDPH* Review and Approval

Reuse Segregated Material Under the Durable Cover with SFDPH Approval

Proceed with Additional Work under the Guidance of the RMP

11 Is On-Site Treatment of Hazardous Substances Contaminated Soil Approved by the SFDPH*?

YES

NO

11A Treat and Resample Segregated Material Until Hazardous Substances Concentrations are **BELOW** applicable ROD Remediation Goals, Petroleum Tier 1 Screening Criteria (if applicable), or RSLs

11B Dispose of Segregated Material Off-Site

Prepare Closure Report for SFDPH* Approval and Notify FFA Signatories

FFA SIGNATORIES:
US ENVIRONMENTAL PROTECTION AGENCY (EPA)
DEPARTMENT OF TOXICS SUBSTANCES AND CONTROL (DTSC)
REGIONAL WATER QUALITY CONTROL BOARD (RWQCB)
US DEPARTMENT OF THE NAVY (NAVY)

NOTE:
SFDPH* - on this chart indicates, as stated in the text of Section 4.0, that this could be SFDPH and/or a FFA signatory.

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